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How Should Albertans Use Their Natural Resources ?

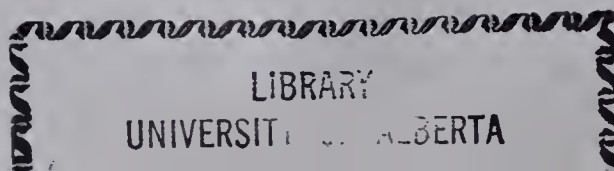


GRADE 4

Alberta, Our Province

TOPIC A

Alberta, Past, Present and Future: Our Natural Resources




Preface

When the task of revising Alberta's social studies programme drew to a close in Spring, 1978, the Social Studies Curriculum Co-ordinating Committee turned its attention to the question of how to demonstrate the intents of the revised curriculum in specific instructional terms. After considerable consultation with teachers, it was concluded that carefully designed teaching units focusing on curriculum topics would be of great help to social studies teachers seeking to implement the revised curriculum guidelines.

Specifically, the approach taken was that a number of experienced social studies teachers, consultants and university instructors were contracted by the Curriculum Branch of Alberta Education to develop inquiry units that fulfilled the following conditions:

- addressed specific value, knowledge, and skill objectives for a prescribed curriculum topic;
- demonstrated the Alberta curriculum's "process of social inquiry";
- incorporated a wide range of teaching/learning strategies, including creative use of one or more prescribed learning resources;
- tested out successfully in a variety of classroom situations.

 This teaching unit is not prescriptive. Rather it is intended to demonstrate one way that the rationale of the Alberta curriculum can be implemented, and one way that the objectives for the curriculum topic can be attained. Review the unit, try it out, and discuss it with colleagues. Keep in mind that it will serve its purpose if it helps you to become more creative in your teaching and more understanding of the goals of the Alberta curriculum, and if it leaves you with a feeling of fulfillment as a social studies teacher.

Although the teaching units have been piloted, a more in-depth assessment can only be obtained from teachers and students during normal classroom usage. Therefore, the evaluation questionnaires located at the end of the teaching unit should be completed and sent to the Regional Office in your area. Thank you.

Frank Crowther
Project Director

Acknowledgements

A number of people contributed significantly to the development and production of this teaching unit. Alberta Education wishes to recognize in particular the contributions of the following people:

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Alberta Environment, Government of Alberta. Environment Views. Vol. 1, No. 1, April-May, 1978. Edmonton, Alberta. Reprinted from Environment Views.

British Columbia Teacher's Federation. "Homesteading in Saskatchewan". Language Arts Item 9226. Vancouver, B.C.

Calgary Herald. "Gas line leak forces residents out of homes". August 8, 1978. Calgary, Alberta. Reprinted with the permission of the Calgary Herald.

Carroll, J.A. and L. Mulberry. Canadian Communities. Scarborough, Ontario: Ginn and Company, 1975.

Department of Economic Development, Government of Alberta. Industry and Resources Brochures. Edmonton, Alberta; July, 1975.

Hill Douglas. The Opening of the Canadian West. Don Mills, Ontario. Reprinted with the permission of the publisher, Academic Press Canada Limited.

MacEwan, The Hon. Grant. "Disease once again threatens beleaguered buffalo". Column in Calgary Herald, August 14, 1978.

Robertson, Heather. Salt of the Earth. Toronto, Ontario. James Lorimer and Co., Publishers, 1974.

School Aids and Text Book Publishing Company Ltd. Indians of Canada and the Prairie Pioneers. Regina, Saskatchewan, 1936.

Tomkins, D. and G., and N. Scarfe (joint Authors). Alberta: Where Mountains Meet the Plains. Agincourt, Ontario. Gage Educational Publishing Ltd., 1970.

University of Alberta Press. Atlas of Alberta. Edmonton, Alberta, 1969.

Vincent, Jeremy and Meakin, David. This Land, These People. Longman Canada Ltd., 1973.

Wiley, William, et al. Canada: This Land of Ours. Scarborough, Ontario. Ginn and Company, © 1976.

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Boon, I and Boon, M. Alberta: Western Treasure Chest. Calgary, Alberta. Western Canada Institute Limited, 1950.

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Taylor, Anne. "What Do You Think?", Canadian Children's Magazine. Victoria, B.C. Summer, 1977.

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NOTE:

Pages that are termed "Student Handout" or "Student Activity Sheets" are intended for duplication. It is imperative that these particular Teaching Unit Pages be neither cut nor marked so that they will continue to be useful in future years.

ALBERTA, PAST, PRESENT, FUTURE: OUR NATURAL RESOURCES

A. INTRODUCTORY NOTES

1. List of Unit Contents

The unit--entitled "Alberta, Past, Present and Future: Our Natural Resources" contains a variety of resources (excerpts, maps, sketches, student masters, and games) and activities for teachers to use with their students. The unit objectives are stated; a unit flow chart depicts in graphic form, the relationships among and between the parts of the unit, and suggested evaluation strategies are included. All student masters, student activity cards and excerpts are located at the back of this unit. A list of references and resources is also available.

2. Notes to the Teacher

The unit focuses on the major issue "How Should Albertan's Use Their Natural Resources?" The theme and basic concepts are taught to students through a variety of lessons and activities either in independent study, small group or large group context. The main portion of the unit study is to be conducted as a station approach. Each station contains learning activities and materials related to the study of one of Alberta's natural resources. Materials and resources have been taken

from a wide variety of sources. Each station should be expanded with resources from the school library and media centre. In order to develop an awareness of change over time and the manifestations of man's impact on his environment and the natural resources, the activities and resources force a student to consider the society of the Indian, the early settler and the contemporary Albertan. The specific details and materials are further elaborated in the introductory notes to each station.

Before station work begins, all students should clearly understand the method of work involved. The writers of this unit also assume that students will possess basic functioning skills in reading; locating information in books, pictures, maps, graphs and tables; writing skills (sentences, paragraphs, stories); and discussion skills (large and small group). In the station method, students must learn to choose an activity, locate and carefully study the associated materials, respond to the questions or tasks and then have their work marked or evaluated in some way.

The station topics are: Land, Water, Fossil Fuels, Plants and Animals, Minerals, and an Activity Station. Work can begin at any one of the first five stations mentioned. The unit writers suggest all students be involved in the study of one of the topics at the same time to facilitate some of the large group activities. However, each station is designed to be sub-divided into mini-work stations and allows for students to work in small groups or

FOCUS QUESTION

"HOW SHOULD ALBERTANS USE THEIR NATURAL RESOURCES?"

This question should be presented to the class following the concept development stage. The focus question can be displayed on a large banner. At this time the students have some idea of what natural resources are and they should be ready to think about how Albertans should use them - they should be ready to form a tentative hypothesis.

Read the following position statements to the children:

1. Albertans should use their natural resources only for themselves.
2. Albertans should sell as many natural resources as they are able.
3. Albertans should share their natural resources with others but this should be done with planning and control.
4. Albertans do not need their natural resources so they should quit mining them and protecting them.

Tell the class that these position statements have been suggested by different groups of people. Ask the children to decide which statement they think is the answer to the question. Perhaps some children may wish to add another solution of their own. Encourage the children to record their choice and the reasons for their choice on paper.

It is advisable to display the children's responses so that they will be available to them throughout the unit. Display them under a large banner containing the words of the focus question.

Please note:

It is important for all students to do this activity as it is the central issue for the entire unit; however, students must realize that the conclusions they have come to are only tentative and that further inquiry is needed to justify their positions.

RESEARCH (INQUIRY) ACTIVITIES

The inquiry stage of this unit is to be conducted as a station approach. Five major stations have been identified - land, water, fossil fuels, plants and animals, minerals. At each station a variety of activities and resources are suggested. Small group and independent study followed by large group discussion and review are the major learning strategies employed.

Each station begins with an introduction and overview directed to the teacher. Specific suggestions and details for the particular station are outlined. Each station includes student activity cards and excerpts. An answer key for the student activity cards is provided. Suggestions for culmination and evaluation are included in each instance. Resources should be expanded with materials from school libraries and media centres.

LAND

NOTES TO THE TEACHER:

The activities in this station are designed for independent study. A variety of resources and activities are suggested from which the teacher selects and assigns those which are best suited to the abilities and needs of the students. NOT ALL ACTIVITIES SHOULD BE ASSIGNED. When setting up this station, any additional resources related to the following topics should be added:

1. soil type, precipitation and climate,
2. farming in early Alberta,
3. the depression and farming problems,
4. farm machinery and methods.

The suggested activities (p. 149) and excerpts (p. 171) are set out in such a way that they can be xeroxed, laminated and set out for children to use. The primary resource, Alberta: A Province and a People, is used frequently throughout the study at this center. You may wish to place 2-3 copies at this station or take a book apart, laminate the pages needed for the activities at this center and place with the excerpts.

Four or five children would be able to work at any one activity at one time. Provide each student with a scribbler in which to complete the written work. The books should be handed in at the end of each activity to be corrected. Instruct students to move onto the

next activity or take a "break" at the activity and fun station whenever they complete a mini-activity.

A minimum of five or six class periods (one hour in length) will be needed to complete sufficient activities in this section.

A short sharing time at the beginning and end of each class period could be used to share ideas, check learning and plan for the next set of activities. The culminating activities should be carried out with the whole class.

SEQUENCE OF LEARNING ACTIVITIES

Opener: Use of Relief Map of Alberta (Use relief map provided by Alberta Education to all schools.)

Prior to moving into the independent study activities, the teacher may wish to conduct a large group or class discussion on the different vegetation and topographical areas in Alberta.

1. Have children study the relief map.
2. Direct attention to various topographical features by stating questions:
 - (a) Where are the mountains, foothills, prairies?
 - (b) Where are the main rivers and lakes?
 - (c) Where is the area flat, rolling, mountainous?
 - (d) Where are the prairies in relationship to the

mountains; lakes and river flow in relation to the mountains?

- OR -

3. Select several appropriate activities which accompany the the relief map in order to familiarize the students with the variations in the "land" of Alberta.

INDEPENDENT STUDY ACTIVITIES

A number of student activities and resources have been designed related to the topics of soil types; farming methods and problems; the depression and farm machinery and changes. All the student activities appear as STUDENT ACTIVITY CARDS on pages 149 through 169 and are prepared in such a way they can be easily mounted and laminated for student use. The student resources, which appear as EXCERPTS 1 to 14 (p. 171 to 198), are also ready for immediate mounting and use.

The answer key, following immediately, provides answers to questions on STUDENT ACTIVITY CARDS which have definitive answers.

LAND: ANSWER KEY

ACTIVITY ONE: Reading to Find the Answer

A. Soils in Alberta (Land: excerpt 1)

(a) The soil best suited for farming is the Black soil.

- (b) The poorest soil areas are Grey Wooded and Brown Wooded soils.
- (c) Besides the rich soil a degree of moisture and warmth (sunlight) are needed.
- (d) Renewable resource. Rest of answer will vary.

B. How Indians Used the Land (Land: excerpt 2)

- (a) The first inhabitants in Alberta were Indians who were hunters.
- (b) The Indians followed the buffalo to hunt and kill it.
- (c) The horse made it easier for the Indian hunters to follow the buffalo, ride in a hunt and move faster.
- (d) "Adapt to the environment" means that the Indians learned to live comfortably in their surroundings - they made use of the things they found around them.

C. The Cattlemen (Land: excerpt 3)

- (a) Unfenced grazing came to an end as a result of:
 - (i) coming of the settler
 - (ii) invention of the barbed wire fence
 - (iii) realization that cattle had to be kept safe during the winter.
- (b) Barbed wire fence kept cattle penned because the sharp barbed points hurt when the cattle tried to climb through the wires.
- (c) The cattlemen used the tool (technology) of barbed wire.

D. Early Settlers Settle the West (Land: excerpt 4)

- (a) The C.P.R. received grants of land in return for building the railway.
- (b) The C.P.R. and government decided to have the land settled.
- (c) The government hoped to entice and encourage settlers to come west through its advertising campaign.

(d) A homestead is 160 acres or 65 hectares of land.

(e) To get a homestead a settler had to:

(i) pay \$10.00

(ii) build a house and live on homestead for half the year

(iii) plow the land and plant crops for 3 years

(f) ANSWERS WILL VARY

E. Starting to Farm (Land: excerpt 5)

(a) A settler paid \$10.00 for his right to a piece of land

(b) Total amount = \$850.00

(c) ANSWERS WILL VARY

F. How the Early Settler Used the Land (Land: excerpt 6)

(a) Early settlers used a wooden plow

(b) The early settler seeded his land by hand (broadcasting)

(c) A drill is a machine (tool) which a farmer used to plant his seeds in the soil

(d) The settler pulled or dragged a pile of brush across the seeds to cover them with soil

(e) ANSWERS WILL VARY

G. Harvesting the Crop (Land: excerpt 7)

(a) The grain was cut by hand with a scythe or sickle

(b) A binder is a machine which cuts the grain, binds it into bundles and drops it in piles of bundles around the field

(c) A threshing machine separates the grain from the straw and chaff

(d) Different jobs include: engineer, carrying bags of grain, straw stack man, feeder man, bringing bundles

(e) ANSWERS WILL VARY

H. The Threshing Crew (Land: excerpt 8)

- (a) The group of men who arrived at a farm to assist the farmer in the harvest of his crop were called a threshing crew.
- (b) Because the work was mainly done by hand and there were a great variety of tasks to be done, a number of men were needed
- (c) The men slept where they could find a dry, warm and quiet spot - barn, wagon, straw stack, hay piles
- (d) ANSWERS WILL VARY

I. Problems of the Early Settlers (Land: excerpt 9)

- (a) The pioneers needed a new plow which would not completely turn the soil and expose it to the wind and sun
- (b) Summerfallow means to leave a field cultivated and unplanted for a year
- (c) Harrowing is the process of spreading a layer of fine, dry soil on the surface to prevent the moisture from escaping
- (d) The early farmer used a plow and harrow
- (e) The use of the tools by the early farmer could cause erosion and soil drifting
- (f) The settler never knew what the weather would be like - sometimes it was too wet, sometimes not wet enough
- (g) Smut and rust attacked the crop

J. Homes of the Early Settlers (Land: excerpt 10)

- (a) A dugout is a cave-like room dug into a hillside
- (b) A sod house was a house built out of blocks of prairie soil
- (c) The sod blocks were made by using a walking plow to cut up the prairie soil. Then the turf was cut into foot-long pieces or blocks with a spade or axe.

- (d) Not many trees grew on the prairies so the settlers did not have the wood available.
- (e) The roof turned green because the seeds and plants in the sod blocks sometimes sprouted.
- (f) ANSWERS WILL VARY
- (g) The early settler used a plow, spade, and axe to build his sod house.

K. The Farmer Today (Land: excerpt 11)

- (a) New ways of farming today include:
 - (i) leaving the stubble standing in the fields to hold the soil. Weeds are cut off at the roots by a sub-surface cultivator.
 - (ii) use of weedkillers such as 2-4-D
 - (iii) the practice of contour plowing (around a hill)
 - (iv) strip farming and plowing at right angles to the directions of the wind.
- (b) Farms have become larger because new powerful and efficient machines can prepare land and harvest crops very quickly. Thus, in the limited time huge parcels of land can be cultivated.

L. Mountain Scenery as a Natural Resource (Land: excerpt 12)

- (a) Banff and Jasper are the two most important National Parks.
- (b) The first settlers were attracted by the hot springs at Banff.
- (c) Jasper was a trading post.
- (d) Cattle rustlers and thieves hid cattle and horses in the canyon of Waterton Park.
- (e) Plants and animals are protected in the National Parks.
- (f) ANSWERS WILL VARY.

M. Tourism (Land: excerpt 13)

- (a) Alberta has 5 national and 52 provincial parks.
- (b) Tourists need a place to sleep, eat, park their cars and do recreational activities.
- (c) For tourists to be able to reach all parks, Alberta needs highways.
- (d) ANSWERS WILL VARY.
- (e) ANSWERS WILL VARY.

ACTIVITY TWO: Reading a Picture

A. Hunting Buffalo (Alberta: A People and a Province, p. 26 & 27)

- (a) Possible answers might include: horses, men, buffalo, rocks bushes, travois, cliff, valley, boulders, saddle, Indians.
- (b) The buffalo were driven over the cliff.
- (c) The Indians used stones, hatchets, knives and later guns to kill the buffalo.

B. Homes of the Early Settlers (Alberta: A People and a Province, p. 35)

- (a) Possible answers might include: hole, tub, dirt, grass roof, bones
- (b) Advantages might be warmth, inexpensive to build, easily constructed
- (c) Disadvantages: dirty, dark, cannot move it.

C. The Sod House (Alberta: A People and a Province, p. 34)

- (a) Possible answers include: straw, poles, chimney, men, dog shovel, bones, window, door, fur skin.
- (b) Advantages: inexpensive to build, can be built in different sizes; cool in summer and warm in winter

Disadvantages: erode easily, could rain through roof and walls, constant repair needed, dirty

(c) ANSWERS WILL VARY

D. The National Parks (Alberta: A People and a Province, p. 17 & 18)

(a) The Canadian government runs the national parks.

(b) The government created national parks so that all people can enjoy the beautiful area.

(c) ANSWERS WILL VARY

(d) ANSWERS WILL VARY

ACTIVITY THREE: Reading a Map

A. Indian Tribes in Alberta (Alberta: A People and a Province, p. 25)

(a) Names of tribes include: Cree, Beaver, Chipewyan, Slave, Plain, Blackfoot, Blood, Peigan, Sarcee, Stoney.

(b) ANSWERS WILL VARY

(c) The Cree, Beaver groups in the north had the largest territory. The Indian tribes were spread all over Alberta and each group of tribes had definite territories.

B. Soils in Alberta (Atlas of Alberta, p. 34)

(a)	(i)	Calgary	<u>Black</u>
	(ii)	Medicine Hat	<u>Brown</u>
	(iii)	Edmonton	<u>Black</u>
	(iv)	Grande Prairie	<u>Dark Grey</u>
	(v)	Red Deer	<u>Black</u>
	(vi)	Lethbridge	<u>Dark Brown</u>

(vii) Lloydminster Black

(ix) Your Home _____

(b) People settled on the richest and best soils first.

(c) ANSWERS WILL VARY.

(d) ANSWERS WILL VARY

C. National Parks in Alberta (Alberta: A People and a Province, p. 16)

(a) The provincial parks are much smaller.

(b) The National Parks include: Jasper, Banff, Waterton, Wood Buffalo.

(c) ANSWERS WILL VARY

(d) ANSWERS WILL VARY

Please Note:

ANSWERS WILL VARY FOR ALL EXERCISES IN ACTIVITY FOUR (Creative Activities) AND ACTIVITY FIVE (Conducting Interviews).

ACTIVITY SIX: Reading a Graph

A. Farm Machinery in Alberta (Alberta: A People and a Province, p. 68)

(a) Machines no longer in use are the grain binders and threshing machines.

(b) They have been replaced by faster, more efficient, newer machines.

(c) New machines include hay balers, combines and swathers.

(d) Machines used over a long period of time are trucks, tractors, swathers.

B. Mean Precipitation (Land: excerpt 14)

2.(a) Medicine Hat

(b) Edmonton

(c) Calgary 1905 to 1910

Banff 1900 to 1905

Edmonton 1905

Medicine Hat 1900 to 1905

(d) Calgary 1960 to 1965

Banff 1920 to 1925

Edmonton 1925 to 1930

Medicine Hat 1910 to 1915

(e) 1900 to 1905 or 1950 to 1955

(f) 1925 to 1930 or 1960 to 1965

3.(a) ANSWERS WILL VARY

(b) ANSWERS WILL VARY

4. ANSWERS WILL VARY (focus on lack of precipitation)

Please Note:

ANSWERS WILL VARY FOR ALL EXERCISES IN ACTIVITY SEVEN (Using the Encyclopaedia); ACTIVITY EIGHT (Using the Dictionary); ACTIVITY NINE (Using the Index).

CULMINATION AND EVALUATION ACTIVITIES

At the completion of the independent study activities related to the topic of LAND, the teacher should bring the children together for a number of activities to culminate or synthesize the learnings and evaluate to what extent unit objectives have been met in the study of one topic.

A number of activities designed for purposes of synthesis and evaluation are provided. NOTE: A teacher may wish to set a quiz or test at this time.

The culmination and evaluation activities include the following:

A. Retrieval Chart:

People	Needs Supplied by the Land	Technology Used	Changes in the Land
Indians			
Early Settlers			
Albertans Today			

B. Personal Statement:

Have each child answer the following question in paragraph form. Then place the children in groups of 3 or 4 to exchange their answers. Follow the small group discussions with large group discussions.

"Is soil (land) a renewable or non-renewable resource?
Explain your answer."

C. Value Issues:

1. Ranking Exercise.

Have each child rank order a series of situations similar to the examples below:

(a) Which would you rather be?

- an early Indian
- an early settler
- an Albertan today

(b) What would you rather do?

- plow as much land as possible
- plow as much land as needed
- plow enough land to feed Albertans

(c) Where would you rather be on a Saturday afternoon?

- in the woods
- in a store
- in the mountains

2. "I urge telegrams"

Have each child (after clarifying the use of pesticides and insecticides) complete an "I urge telegram" stating a position regarding the use of insecticides and pesticides by Alberta farmers. The student is asked to choose a real person and write a telegram to that person beginning with these words: "I urge you to....." The message is to consist of 15 words or less. The student is to sign his name to the telegram. The telegram could be shared in class and/or sent to the District Agriculturist. (Telegram forms can be obtained from CPCN Telecommunications).

3. "Discussion"

Divide the children into small groups; appoint a recorder for each group. Allow each group 10-15 minutes to discuss and record their main ideas on a large chart. Have each group report to the class and post their charts on the bulletin board.

- (a) Should Albertans continue to use land or should they try to take care of it for future users?
- (b) Should Albertans save good farmland for farming or let it be used to build houses and highways?
- (c) Should we respect the early Albertan settlers for their ingenuity in homesteading? Why? Why not?

4. Values Geography:

This strategy can be used to help students clarify how they feel about their own environment. Students are instructed to find a partner and show for two minutes something about how they think about the question posed. The teacher might ask some clarifying questions as:

- (a) Are you proud to be associated with Alberta?
- (b) What is the nicest thing about Alberta?
- (c) Where is a place you would like to vacation for a week?
- (d) Where is the most beautiful place in Alberta?

W A T E R

Introductory Activity for Section on Water

MAP EXERCISE: Alberta's Lakes and Rivers

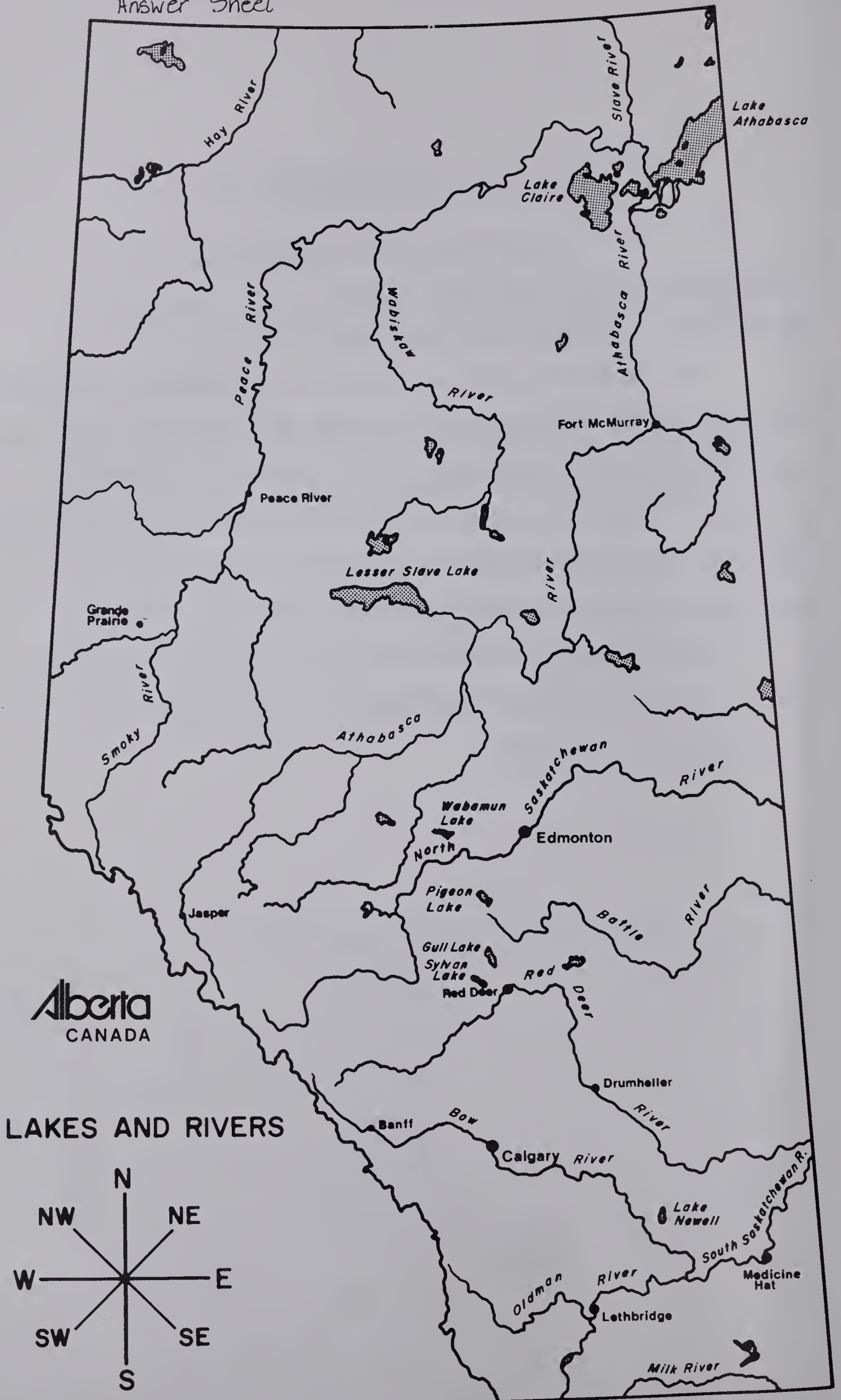
All children in the room should do this activity at the same time. Each child should be given a copy of the Alberta map and of the exercise. Each child should also have an Atlas which includes a map of Alberta. Direct the students to locate the cities, rivers and lakes and to mark them on their map. It would be good to check this part of the exercise with the students before they begin with question 5.

The master copy of the map and directions for the students can be found in the Student Master Section, Student Master #9 and #10, located on pages 134 and 135.

ANSWERS

Question 5 - Map Exercise - Alberta's Lakes and Rivers

- | | | |
|----------------|-------------|-------------|
| 5. (a) N or NE | (g) SW | (m) SE |
| (b) S | (h) E | (n) NE |
| (c) W | (i) NE | (o) E or SE |
| (d) SE | (j) NW | (p) NW |
| (e) NW | (k) E or NE | (q) SW |
| (f) SE | (l) SE | |



LAKES AND RIVERS

WATER

NOTES TO THE TEACHER:

Small Group Inquiry:

Divide the students into groups with approximately four students in each group. Appoint a leader for each group. Also make sure that at least one strong reader is in each group. The children should be directed to work as a group, discussing the answers to each of the questions or activities. Children may write the answers to the questions and problems in their own individual scribblers or they may choose to compile only one book for their group. Once an activity has been completed it should be corrected by the teacher. However, the teacher should be "free" as much as possible in order to walk around giving help and suggestions where they are needed.

Setting Up the Activities:

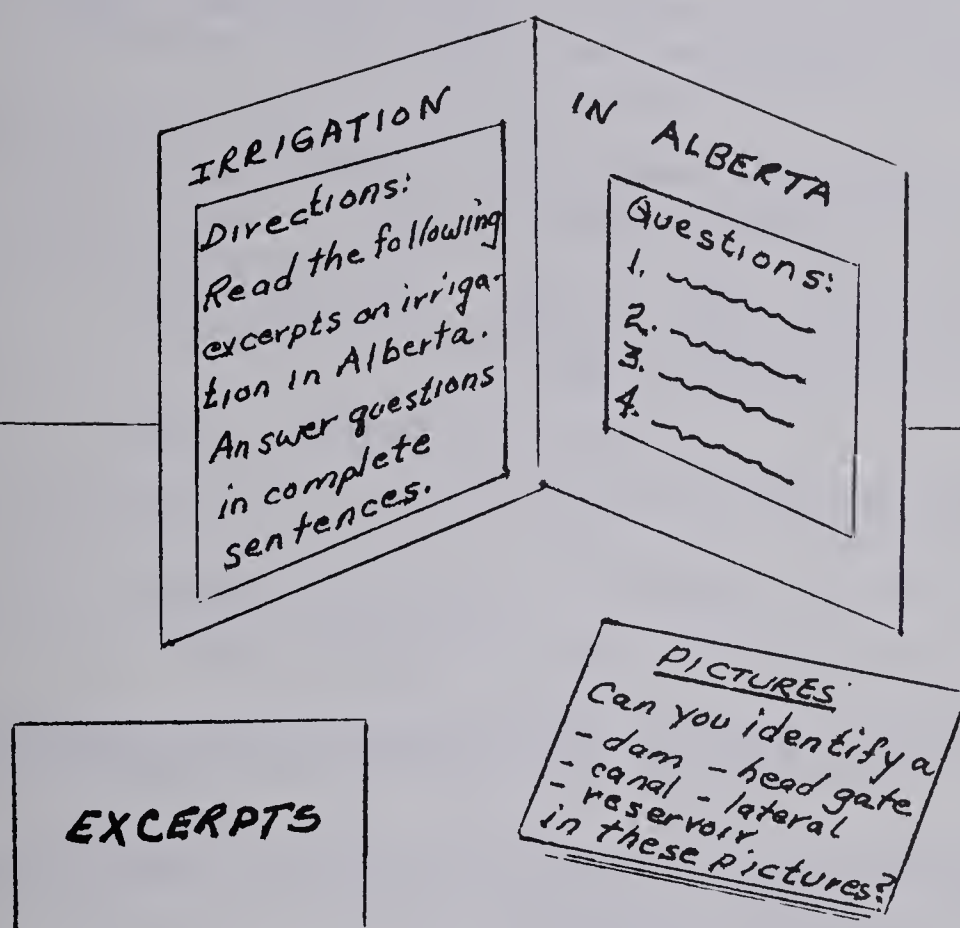
There are more activities included than could possibly be completed by the students. Look at your students' needs and abilities and choose activities that are appropriate for them. Assign each group of students to a particular activity. When they have completed that activity successfully, let them move to a new activity station. The activities that you choose can be set up around the room on counter tops, on tables, on desks, on the floor, or in the hallway. The group of students working on a research question could be directed to work with the librarian in the

school library (plan with her ahead of time, however, to make sure that the library is available and that the librarian knows what is expected of the students). When setting up your stations include the excerpts from this section but also add any pictures, articles, filmstrips, or reference books that you have available at your school or regional office (again your librarian would be a good person to help you set up these stations for she is probably most familiar with the materials that can be found in your school).

Resource materials should relate to the following topics:

- (a) Types of water (rain water, surface water, well water, mineral water, sea water).
- (b) Sources of water in Alberta.
- (c) Uses of water.
- (d) Drainage system of the rivers in Alberta.
- (e) Irrigation.
- (f) Water cycle.
- (g) Fishing in Alberta.
- (h) Water pollution.

It is necessary to set up more station activities than the number of groups that you have. This enables the children to move from one activity to another without disturbing a group already at an activity. The materials for each station could be set up in cardboard boxes, in folders or envelopes or they could be set up as indicated in the following diagram.



A minimum of 4-5 class periods (one hour in length) will be needed to complete sufficient activities in this section.

A short sharing time at the beginning or end of each class period would be beneficial. At this time the students may share interesting facts that they discovered while working at the stations. They might also share some information or a picture that they have found at home. This is also a good time in which to give further directions and to evaluate the way the work went that day.

Please Note:

All of the student activities appear as STUDENT ACTIVITY CARDS on pages 199 through 210, and are prepared in such a way they can be easily mounted and laminated for student use. The student resources which appear as EXCERPTS 1-9 (pages 211 to 233) are ready for immediate mounting and use.

The answer key, following immediately, provides answers to questions on STUDENT ACTIVITY CARDS.

WATER: ANSWER KEY

ACTIVITY ONE: Reading to Find the Answer

A. Natural Waters (Water: excerpt 1)

- (a) Rain water is the purest form of natural water.
- (b) Mineral water is good for healing and refreshing people's bodies.
- (c) Natural waters contain impurities because the water flows over dirt, rocks and vegetation.
- (d) Sea water is not found in Alberta.
- (e) People and animals need water so they will not die.

B. Sources of Water (Water: excerpt 2)

- (a) Lake Athabasca is the largest lake.
- (b) Slave River is the largest river.
- (c) Water comes from snow, rain, sleet, hail, frost, dew, fog and the ice fields.
- (d) Forests help to hold moisture in the soil. They also shade the earth so that evaporation of water takes place more slowly.

- (e) Reservoirs get water from nearby rivers.
- (f) The water in reservoirs is used to provide moisture to areas that get very little rainfall. Some of the water also provides hydro electric power.

C. Uses of Water (Water: excerpts 3 and 4)

- (a) Indians - drinking, transportation

Early Settlers - transportation, drinking, steam locomotives, steamships, crops, swimming

Today - ANSWERS WILL VARY

- (b) ANSWERS WILL VARY

- (c) ANSWERS WILL VARY

D. Drainage System of the Rivers in Alberta (Water: excerpt 5)

- (a) The rivers flow in a north-easterly direction.

- (b) Alberta's rivers drain into the Arctic Ocean, the Hudson Bay and the Gulf of Mexico.

- (c) Arctic Ocean - Peace River, Athabasca River

Hudson Bay - North Saskatchewan River, South Saskatchewan River, Bow River, Old Man River

Gulf of Mexico - Milk River

- (d) ANSWERS WILL VARY

E. Irrigation (Water: excerpt 6)

- (a) To provide moisture to the soil so that crops can be grown. To provide moisture in areas where there is not enough rainfall.

(b) Mainly in southern Alberta

(c) ANSWERS WILL VARY but should include ideas such as:

- water comes from large reservoirs
- open ditches take the water from the dams to the farms
- smaller ditches called laterals take water from main ditch to farmer's field

(d) He opens and closes head gates.

(e) A portable sprinkler system

F. Water Cycle (Water: excerpt 7)

(a) Water is a natural resource because it is formed by nature and used by man.

(b) Water is a renewable resource because it can be replenished and used again.

(c) ANSWERS WILL VARY.

G. Fishing in Alberta's Lakes and Rivers (Water: excerpt 8)

(a) To provide food, to earn money and for sport and pleasure.

(b) Fish Hatcheries raise tiny fish and then stock the lakes.

(c) Fish licences are sold in order to control how many fish are caught at any one time.

(d) ANSWERS WILL VARY but should include the idea that the Government wishes to protect and conserve how many fish are being caught and where they are being caught.

H. Water Pollution (Water: excerpt 9)

(a) A river becomes polluted and unsafe to use.

(b) Oxygen helps to "break down" the waste materials that are put into the water. If too much material is in the water,

there is not enough oxygen to break down all of the material and the lake becomes polluted.

- (c) Department of Health checks for amount of waste material in water.

Approval must be given before new systems open.

Swimming pools are inspected.

Daily records of fluoridation are kept.

- (d) So that they know and the government knows that the lakes and rivers will not become polluted.

Please Note:

ANSWERS WILL VARY FOR ACTIVITIES TWO TO NINE.

CULMINATION ACTIVITIES

ACTIVITY ONE: Problem Situations

The students should again be brought back together as one large group. Discussions on some of the following problem situations should be held. How well the children can respond to the question will give some indication as to their understanding of water as a natural resource. It is important for the children to give reasons for their suggestions. It is also important for them to look at and to discuss the consequence of their suggestions. During this section the teacher may guide the children in their discussions or it would be possible to let one or two of the students lead the discussion. It is not necessary to have the students discuss every one of the problem situations.

Problem Situation 1

Farmers who own land next to rivers and lakes are not required to set their operations back from the shoreline. Crops can be planted right to the shoreline and cattle can graze right to the water's edge. Trees next to the shoreline can also be cut down. This can result in a deterioration of the quality of the water from erosion, from dirt, silt and minerals seeping through to the water and from the application of pesticides and fertilizers. Feedlots used for the animals may also cause animal wastes to enter the water. Should Albertans be concerned about this practice? What do you think? Why do you think this way? Can this practice be regulated? How?

Problem Situation 2

In southern Alberta natural lakes are nearly non-existent and irrigation reservoirs provide the only substitute. Often conflicts arise between the farmers and people who want to go swimming because both want the water at the same time. Some people have suggested that southern Alberta's river shorelines should be developed so that people can relax and enjoy themselves and that this would help to eliminate the problem. What do you think? Should Alberta's river shorelines be developed to provide recreational area for people? Why, do you think this way? What would have to be done to the rivers to make them into recreational areas?

Problem Situation 3

On some lakes in Alberta you can find fishermen, boaters and swimmers all at the same time. Sometimes this causes conflict. Fishermen have different needs than water skiers; canoeists do not want power boats upsetting them; and swimmers and waterfowl are both threatened by speeding boats. Some people have suggested that Albertans should designate different lakes for different uses and this would help solve the problem. One lake could be set aside for fishing, one for swimming, one for waterfowl and one for boating. What do you think of this suggestion? Should Albertans designate different lakes for different uses? Why do you think this way?

Problem Situation 4

Some people in Alberta own their own cottage and sometimes they are built right next to the shoreline of lakes. Often the people have owned their cottage for so long that they feel that the beach in front of the cottage is "theirs". In actual fact a new law in Alberta requires that at least 6.096 meters (20 feet back from the shoreline) belongs to the public. Sometimes a conflict situation arises when the public use the beach directly in front of a cottage. Often they leave litter lying about or they make too much noise. Occasionally the owners of the cottage have built a dock or boathouse on the shoreline. Should the owner of the

cottage be allowed to build a dock or boathouse on the shoreline? What do you think? Why do you think this way?

Problem Situation 5

Industrial plants and factories are often located next to a river so that they can have easy access to the water supply. Some factories let their waste products flow into the river. This practice pollutes the water. Should Albertans let this practice continue? What do you think? Why do you think this way? Can this practice be regulated? How?

Problem Situation 6

Pretend that the land surrounding a lake in Alberta is owned by three different groups of people. Some of it is owned by the Provincial Government, some by private developers, and the rest is part of an Indian Reservation. Let us also assume that the private developers want to make a resort on their land. This resort is to include cottages, a campground, two hotels, a golf course, a marina and some stores. The other two land owners have concerns about this future development and the affect that it will have on the lake and the surrounding area. What are some of the concerns that the land owners might have? What do you think they should do about their concerns?

Problem Situation 7

In the cities of Alberta, the people have always used water for washing clothes, for daily bathing, for disposing of wastes, for washing the car and for watering lawns. More and more industries are now being built up in these same cities. Often they use a great deal of water to help with their operations. As more industries and factories are started, more and more people move into the cities and they make use of the available water supply. The cost of water is fairly low and the people find it very useful. They use more and more of it. Sometimes they are not very careful in the use of the water. They waste it and they pollute it.

Should regulations regarding the use of Alberta's water supply be enforced? For example, lawns can be watered only on a Friday and cars cannot be washed during July.

Should Albertans be allowed to waste their water supply? What do you think? Why do you think this way?

Should Albertans be allowed to pollute their water supply? What do you think? Why do you think this way?

ACTIVITY TWO: Crossword Puzzle - Water

A crossword puzzle using terms learned in the unit on water may be given at this time. It could be used as an individual evaluation

exercise. This crossword puzzle could also be put into the Activity Station if you do not wish to use it now.

The master copy of the crossword puzzle can be found in the Student Master Section, Student Masters #11 and #12, located on pages 137-138.

WATER CROSSWORD PUZZLE: ANSWER KEY

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										L											O																																
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FOSSIL FUELS

NOTES TO TEACHERS:

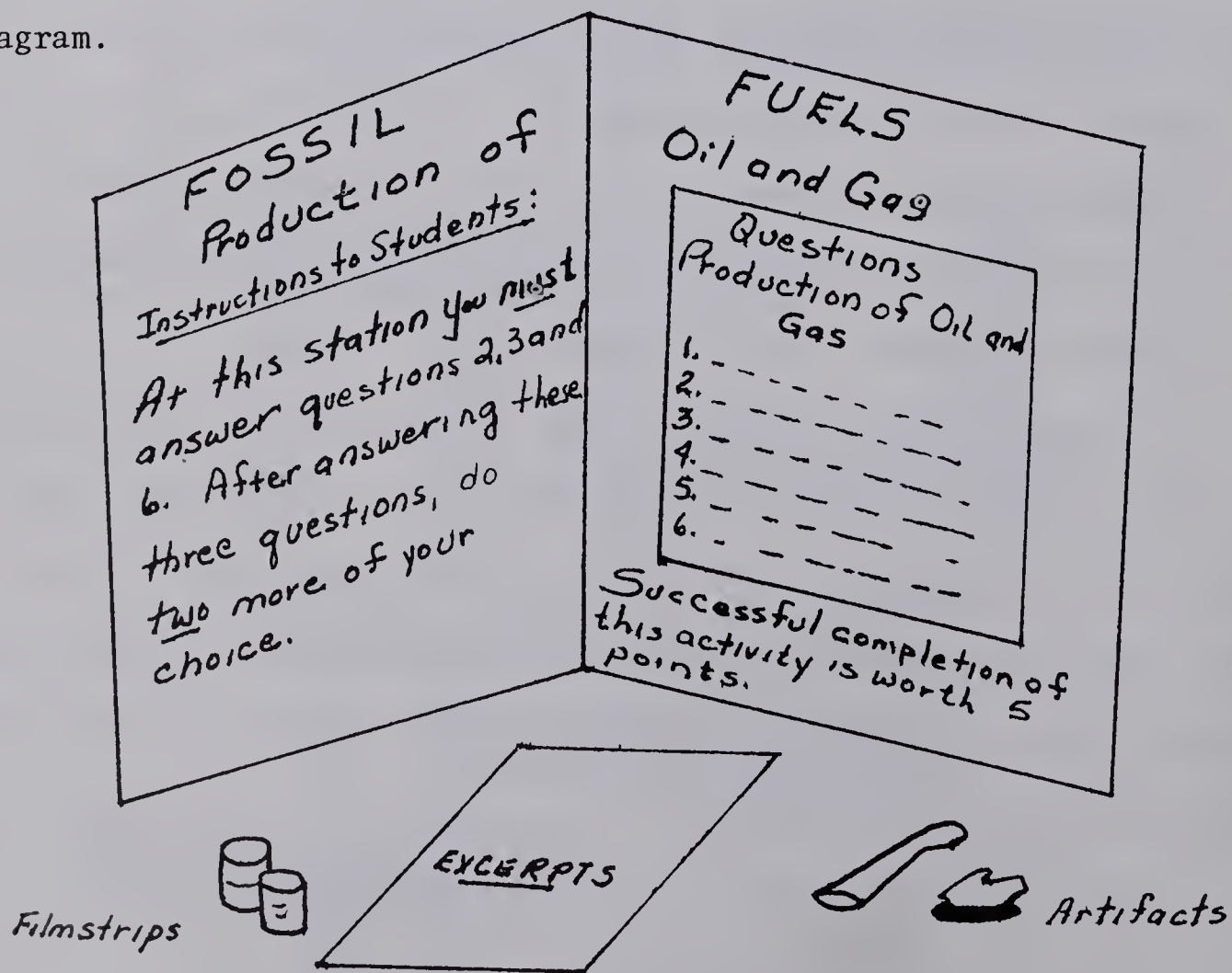
The majority of the activities for this section on fossil fuels are designed to be set up as independent activities for the children to work on. There are far too many activities for the children to do all of them. Many will have to be considered optional but we have included enough so that you will have some choice and can therefore better meet the needs of your particular students. You may wish to choose 3 or 4 activities that all students must do. The rest can be set up as optional activities that the children can choose from. Perhaps you would like to make each activity worth a certain number of points - making activities that are harder or more challenging worth more points. For example up to 5 points could be awarded for an assignment that has been completed successfully. (You may wish to help each child set a realistic goal as to the number of points he hopes to achieve in this section).

We have included a limited number of articles or excerpts on the topic of fossil fuels to help you in setting up your activities. When setting up your activities be sure to add any additional print material, pictures, filmstrips, charts, maps and artifacts available in your school or regional office. Be sure to ask your librarian to share in your plans and to help you set up the stations.

Resources should relate to the following topics:

1. Formation and origin of fossil fuels.
2. Mining and production of fossil fuels.
3. Uses of fossil fuels by Indians, early settlers, and modern, industrialized Alberta.
4. Conservation and future planning for the use of Alberta's fossil fuels.

We suggest that the excerpts included be mounted on cards and laminated. They should then be set up with the resource material that you have collected (try taping some articles if they are too difficult for your children to read). You may wish to set up mini work stations around the classroom for your children to work at. You could put all of the material for one activity in a box, file folder or envelope or you could use a foldout screen and counter top as indicated in the following diagram.



Four to five children should be able to work at one of the activity stations at any one time. The stations could be set up on counter tops, on tables, on the floor, at a group of desks, in the library or in the hallway. You may even be able to have your librarian supervise and work along with one or two groups of students in the library - particularly in the research activities. She should even be able to help you with the correcting of those particular stations so long as she has been informed and is willing to share and co-operate in the unit.

Provide each student with a scribbler in which he may keep his written work. At the completion of each activity the children should have their books corrected. If too many happen to complete an activity at the same time, suggest that they move on to another station and you will check their books at a later time or at the end of class.

It is important for the teacher to be "free" for much of the class period to walk around giving help and advice where it is needed.

A minimum of 7-9 class periods (one hour in length) will be needed to complete sufficient activities in this section.

A short sharing time at the beginning or end of each class period would be beneficial. At this time children may share interesting things about fossil fuels which they discovered as they were working or things they have brought from home. Perhaps a "museum" might be set up in a corner of the classroom to display objects children have brought. This is also a good time in which to give further directions and to evaluate the way the work went that day.

Please Note:

Some of the vocabulary in this station is quite difficult because of the technical terms needed. If you run into difficulty with the terms, discuss the meaning of some of the words during sharing time so that all will understand them by the end of the station. You might also wish to give teacher-directed lessons to some of your less independent workers.

Please Note:

All of the student activities appear as STUDENT ACTIVITY CARDS on pages 235 through 261, and are prepared in such a way they can be easily mounted and laminated for student use. The student resources which appear as EXCERPTS 1-19 (pages 263 to 298), are also ready for immediate mounting and use.

The answer keys, following immediately, provides answers to questions on STUDENT ACTIVITY CARDS.

FOSSIL FUELS: ANSWER KEY

ACTIVITY ONE: Reading to Find the Answer

A. How Oil and Gas Were Formed (Fossil Fuels: excerpt 1)

- (a) Oil and gas is formed from the bodies of tiny animals that died millions of years ago. Pressure from dirt, rock and water have turned these animals into oil and gas.
- (b) Porous rock contains tiny holes and the pressure from dirt, rock and water causes the oil and gas to travel through these tiny holes.

- (c) Non-porous rock does not contain any holes.
- (d) It is lighter.
- (e) An odour is added.

B. Discovery of Oil (Fossil Fuels: excerpt 2)

- (a) Kootenay Brown and Waterton Park - oil used and sold by Kootenay Brown after it was discovered in Waterton Park. Also site of Alberta's first oil well.

Turner Valley and Dingman Well - site of famous "Discovery Well" (1914)

Leduc - site of large oil find in 1947

- (b) Pembina Field near Drayton Valley
- (c) Oil and gas is sold to people all over Canada and the United States. This is important because it brings lots of money into Alberta.
- (d) ANSWERS WILL VARY

C. Searching for Oil (Fossil Fuels: excerpt 3)

- (a) Core Drilling
Seismology
- (b) Wildcat well - a well that is drilled where no other wells have been drilled before.
- (c) Discovery well - a well in which oil and gas is discovered.
- (d) Sometimes the land is not flat - roads have to be built, supplies and equipment brought in, land must be cleared and occasionally new towns need to be built.

D. Drilling for Oil (Fossil Fuels: excerpt 4)

- (a) A tool pusher is the "boss" or supervisor who is in charge of the rig.

- (b) Floormen (rough-necks)
- (c) The bit cuts through the soil and rock
- (d) Because all of the sections of pipe must be disconnected and then reconnected.
- (e) Mud helps to lubricate and cool the drilling bit. It carries many rock cuttings up to the surface. It helps to prevent the hole from caving in and it helps to prevent the oil and water from escaping.
- (f) In a flowing well, water or gas pressure forces the oil up to the surface. The amount of oil and gas that escapes is controlled by a wellhead.

E. Transportation of Oil and Gas (Fossil Fuels: excerpt 5)

- (a) They will be inconvenienced when their land is dug up and when all of the equipment moves on to their land.
- (b) Because the pipe is so heavy.
- (c) They keep the oil flowing through the pipeline.
- (d) The oil can move quickly and very few people are needed to keep the oil flowing through the pipeline.

F. Refining of Oil and Gas (Fossil Fuels: excerpt 6 and 7)

- (a) Refining changes crude oil into many different products which are of use to man.
- (b) It changes the crude oil to gas or vapour.
- (c) Asphalt and tar
- (d) ANSWERS WILL VARY

G. How Indians Used Oil and Gas (Fossil Fuels: excerpt 8)

- (a) They saw seepage of oil through the rocks and soil

- (b) To seal the seams on the bullboats.
As a healing ointment.
- (c) It was not readily available and there was not a great need for it.

H. How the Early Settlers Used Gas (Fossil Fuels: excerpt 9)

- (a) Gas seeped through the dirt and caused explosions or fires.
- (b) The gas was so cheap it did not pay them to turn them off.
- (c) Street lights, heating homes, cooking food, and in industries.

I. Oil Sands (Fossil Fuels: excerpt 10)

- (a) Oil sands are areas where oil is mixed with sand. Sometimes called "TAR SANDS" because of their black sticky appearance. They are really bituminous deposits.
- (b) The oil sands are located in the Athabasca area around Fort McMurray.
- (c) Large equipment and processing plants are needed. Also many people are needed to do the work.
- (d) It is rapidly increasing in size as so many people are needed to work in the oil sands.
- (e) ANSWERS WILL VARY but should include ideas such as: need to build more houses, stores, schools, provision of more recreational services, better police protection.

J. Alberta's Oil Sands Projects (Fossil Fuels: excerpt 11)

- (a) Albertans see the need for oil. They want to be sure they have some for the future and also when they sell it they make money.
- (b) A partnership of oil companies and government that joined together to provide the necessary funds, equipment and technology needed to mine the oil out of the sands.

- (c) Trees are cut down and birds flying north and south would not have a stopping point.

ANSWERS WILL VARY for rest of this question.

- (d) Royalties are the money that the oil companies must pay to the Alberta Government each year. It is a share of their profits that they pay the government for being able to mine the oil and gas which actually belongs to the government.

- (e) ANSWERS WILL VARY

K. Alberta Oil and Gas Conservation Board (Fossil Fuels: excerpt 12)

- (a) The Oil and Gas Conservation Board controls how much oil and gas is used. It tries to prevent waste of these necessary resources.
- (b) There is now a market for natural gas - it is more widely used.
- (c) ANSWERS WILL VARY
- (d) ANSWERS WILL VARY

L. How Coal Was Formed (Fossil Fuels: excerpt 13)

- (a) Coal is formed from plants and vegetation that grew on our earth millions of years ago. Weight from heavy deposits of dirt, silt, rock and mud helped to press the plants into layers of coal.
- (b) Hard coal
- (c) Hard coal is formed by very heavy layers of dirt, rock and mud pressing on the plants for a very long period of time.
- (d) Near the mountains

M. Mining Coal (Fossil Fuels: excerpt 14)

- (a) Peter Fiddler
- (b) On the banks of the Oldman River near Lethbridge

- (c) One-third
- (d) Strip-mining method, hydraulic method or underground mining
ANSWERS WILL VARY for second part of question.
- (e) Trees and plants are being replaced, grass is being planted
and water is being reused.

N. The History of Alberta's Coal Industry (Fossil Fuels: excerpt 15)

- (a) To heat homes and offices, for steam locomotives, etc.
- (b) Cheaper supplies of oil and gas and diesel fuels were
available.
- (c) More coal is being used and sold - for power plants and for
Japanese markets.
- (d) ANSWERS MAY VARY but idea that it costs a lot to transport
coal across Canada is important. Ontario can probably buy
coal cheaper from nearby mines in the United States.

ACTIVITY TWO: Reading a Map

A. Oil, Gas, Oil Sands Map (Fossil Fuels: Excerpt 16)

ANSWERS MAY VARY SOMEWHAT

- | | | |
|-----|---|---|
| (a) | High Level
Calgary
Edmonton
Red Deer | Peace River
Lethbridge
Lloydminster |
| (b) | Medicine Hat
Drumheller
Calgary
Lloydminster
Edmonton | Grande Prairie
Grande Cache
Wetaskiwin
Camrose |
| (c) | Gas fields | |
| (d) | Fort McMurray
Lloydminster
Peace River | |

- B Main Pipelines, Refineries and Gas Plants (Fossil Fuels: excerpt 17)
- (a) More gas processing plants
 - (b) Edmonton
 - (c) Probably to cities in other Canadian Provinces and into the United States.
- C. Main Oil and Gas Pipelines in Canada (Fossil Fuels: excerpt 18)
- (a) Mainly in Alberta
 - (b) The direction that the oil flows in the pipelines
 - (c) The arrows show that gas flows through pipelines down into the United States
 - (d) Two
 - (e) Three
- D. Coal Map (Fossil Fuels: excerpt 19)
- (a) Edmonton
 - (b) Lignite
 - (c) Sub-bituminous coal
 - (d) High Volatile Bituminous coal
 - (e) No

ACTIVITY THREE: Reading a Diagram

- A Formation of Oil and Gas (Fossil Fuels: excerpt 1)
- (a) Porous rock is full of little holes and the oil and gas seeps through the holes

- (b) Non-porous rock is solid rock. It is not full of holes and, therefore, stops or traps the oil and gas.
- (c) Natural gas because it floats at the top.
- (d) Water is the heaviest substance because it settles to the bottom.

B. Rotary Drilling Rig (Fossil Fuels: excerpt 4)

- (a) Because it is so large and it has so many parts to it.
- (b) Casing is like a frame that holds the dirt and rock back, thus enabling the pipe to be lowered into the ground .
- (c) Extra pieces of pipe are added.
- (d) The bit brings up an oil solution on it and the bit moves easily - it does not have to cut through what it is touching. Oil might also come up mixed with the mud.
- (e) So it can cut through rock and dirt.

C. Oil Refining (Fossil Fuels: excerpt 6)

- (a) asphalt and tar
- (b) gasoline
- (c) cools down the gas or vapour so it will again become a liquid
- (d) ANSWERS WILL VARY

Please Note:

ANSWERS WILL VARY FOR ACTIVITIES FOUR TO EIGHT

CULMINATION ACTIVITIES

Bring the children back together again for one of the following activities.

1. Field Trip

Plan a field trip to an oil well site, a refinery, a coal mine or a pumping station if at all possible.

2. Interviewing

Invite a parent or resource person into your class to talk about the oil, gas or coal industry and the future of the industry. Have the children prepare questions ahead of time that they could ask this person.

3. Value Issues for Discussion

Divide the children into groups of four people each. Appoint someone to act as a recorder for that group. Allow each group about 10 minutes to discuss and record their main ideas. Have the reporter report back to the main group. You may wish to continue the discussion with everyone once all of the groups have presented their thoughts. This type of discussion can also serve as an evaluation of this section of the unit. (Do the children present realistic thoughts? Are their reasons valid? Can they back up what they are saying?)

- (i) Should Alberta have formed Syncrude? Why? Why not?
- (ii) Should Alberta continue to mine fossil fuels or should it be more interested in protecting the environment of plants, animals and land?
- (iii) Should Alberta continue to use fossil fuels so quickly?
- (iv) Should Alberta continue to share its oil, gas and coal with other communities of the world?

ANIMALS AND PLANTS

NOTES TO THE TEACHER:

This station study has been designed to help students acquire information about the natural resources of plants and animals of Alberta. Materials consist of suggested activities in STUDENT ACTIVITY CARDS, excerpts, and textbook. Materials can be stored in large envelopes, folders or boxes or displayed wherever convenient. The station or centre is not meant to be static but to expand and contract to suit the requirements of the students or classroom.

Descriptions for using this centre are meant only as suggestions. In this plan the suggested activities could operate simultaneously but other arrangements are possible. You may wish to pace the children through a number of basic activities as a large group and consider the remaining activities to be optional and/or independent small group study. Most of the students' references are included. In addition, you will need to gather materials related to the following topics:

1. Plants and animal life in Alberta.
2. Forestry industry and products.
3. Protection of wildlife and forests.
4. Uses of plants and animals by Indians, early settlers and today's Albertans.
5. Conservation and control of the use and exploitation of plants and animals.

The various activities are designed to provide students with

opportunities to practice the skills set out in the statement of objectives. The suggested activities and excerpts are set out in such a way that they can be xeroxed, laminated and set out for the children to use. A number of reference books, dictionaries and the Flora and Fauna Kit should be readily available for children to use.

Four or five children should be able to work at any activity at a time. Provide each student with a scribbler in which he completes his written work. The books should be handed in for corrections. Instruct students to move into the "optional" activities or the ACTIVITY CENTRE as they complete their work.

A minimum of seven or eight class periods (one hour in length) will be needed to complete sufficient activities in this section.

SEQUENCE OF LEARNING ACTIVITIES

Opener: Flora and Fauna of Alberta (Use of Flora and Fauna Kit provided by Alberta Education to all schools)

Prior to beginning the study under the theme of "Animals and Plants", the teacher may wish to stimulate interest by setting up a bulletin board display of the flora and fauna in Alberta (picture sets in Flora and Fauna Kit). A class discussion could be conducted around questions:

- (a) How many of these animals/plants have you seen? Where?
- (b) Do they grow/live in our community? Why? Why not?

- OR -

Select several of the activities included with the kit which are appropriate to the class in order to familiarize the students with the plant and animal life in Alberta.

IN-DEPTH STUDY

A number of student activities and resources have been designed related to the study of animal and plant life as a natural resource in Alberta. All the student activities are stated on STUDENT ACTIVITY CARDS on pages 299 through 319 and are prepared for easy mounting, laminating and immediate use. The student resources appear as EXCERPTS 1-15 (pages 321 through 414) and are also prepared for immediate use.

An answer key, immediately following, provides answers for questions appearing on STUDENT ACTIVITY CARDS. The answer key for the booklet activities are found at the back of each booklet.

ANIMALS AND PLANTS: ANSWER KEY

ACTIVITY ONE: Reading to Find the Answer

A. The Importance of Plants and Animals (Animals and Plants: excerpt 1)

(a) Four ways plants and animals are important:

- (i) plants manufacture oxygen in sunshine so humans can breathe
- (ii) plants provide us with carbohydrates

- (iii) plants and animals provide us with food
- (iv) plants conserve moisture and prevent erosion
- (b) Plants need sunshine in order to produce carbon dioxide and carbohydrates through process of photosynthesis.
- (c) Plants produce the air (oxygen) we need to live.
- (d) Photosynthesis - chemical change taking place in plants
Chlorophyll - green coloring in plants

B. Forestry (Animals and Plants: excerpt 2)

- (a) Two kinds of trees in Alberta are coniferous and deciduous.
- (b) Pulpmills in Alberta are located at Hinton and Grande Prairie.
- (c) Five steps in pulpwood operation:
 - (i) wood cut into little chips
 - (ii) chips cooled and bleached
 - (iii) mixed rolled and dried
 - (iv) cut into sizes for shipping
 - (v) strong and weak pulp mixed according to kind of paper desired
- (d) Companies make strong paper by adding more strong pulp to the pulp mixture.
- (e) ANSWERS WILL VARY

C. Benefits of the Forest (Animals and Plants: excerpt 3)

- (a) ANSWERS WILL VARY
- (b) ANSWERS WILL VARY
- (c) ANSWERS WILL VARY
- (d) ANSWERS WILL VARY

D. Trees of Alberta (Animals and Plants: excerpt 4)

(a)

Name of Tree	Major Use
Black Spruce	pulpwood
White Spruce	musical instruments
Balsam Fir	varnish
Eastern Larch	poles, ties, bridges
Jack Pine	lumber for houses
Aspen	firewood
White Birch	small furniture
Balsam Poplar	pulpwood
Lodgepole Pine	poles

E. Conserving Our Forests (Animals and Plants: excerpt 5)

- (a) Timber quota system is a system which permits the cutting of trees for five year periods.
- (b) The timber quota system is needed to protect the forests and prevent too much cutting.
- (c) The forests are owned by the government.
- (d) Reforestation means to replant and reseed parts of the forest burned or mined.
- (e) Forest rangers and fighters are trained at Forestry Training School.
- (f) ANSWERS WILL VARY

F. The Forest Ranger and Farmer Work Together
(Animals and Plants: excerpt 6)

- (a) Forests are useful to the farmer:
 - (i) hold snow and prevent it from melting too quickly - less chance of flooding
 - (ii) store water and keep streams running
- (b) Irrigation is a system whereby a farmer can put water in fields by ditches, flooding or sprinkler systems.
- (c) Parts of Alberta are too dry to grow crops without irrigation.
- (d) Farms include: grain, livestock, specialty crops, mixed.
- (e) Both preserve forests.

G. Mammals of Alberta (Animals and Plants: excerpt 7)

- (a) Two changes in mammal life since Indian days include:
 - (i) disappearance of buffalo
 - (ii) increase of elk
 - (iii) fisher and marten becoming rare
- (b) ANSWERS WILL VARY
- (c) ANSWERS WILL VARY
- (d) ANSWERS WILL VARY
- (e) ANSWERS WILL VARY

H. Game Preserves and Bird Sanctuaries
(Animals and Plants: excerpt 8)

- (a) The government sets aside areas so that birds and animals are protected from hunters.
- (b) Animals protected are:
 - (i) Elk Island Park - buffalo

- (ii) Wood Buffalo Park - buffalo
- (iii) Nemiscam - antelope
- (c) Bird sanctuary is a safe area or place for birds.
- (d) ANSWERS WILL VARY

Please Note:

Answers will vary for the exercises in ACTIVITY TWO (Research). ACTIVITY THREE is a game. The correct match appears in the present layout. The answers for ACTIVITY FOUR appear at the back of each booklet. Similarly, answers will vary for all exercises in ACTIVITIES FIVE through EIGHT.

ACTIVITY NINE - Reading a Map

A. Forest Resources (Animals and Plants: excerpt 14)

(a) Forest Management Areas include:

Bow Crow	Grande Prairie	Athabasca
Rocky Clearwater	Slave Lake	Peace River
Edson	Lac La Biche	Footner Lake
Whitecourt		

- (b) Largest - Footner Lake
- Smallest - Bow Crow

(c) Sawmills are located in:

Bow Crow	Grande Prairie	Athabasca
Rocky Clearwater	Slave Lake	Peace River
Edson	Lac La Biche	Footner Lake
Whitecourt		

- (d) Pulp mills are located in Hinton and Grande Prairie.
- (e) ANSWERS WILL VARY

- (f) These areas have been designated as National Parks where plants and animals are protected.
- (g) Most pulpmills are located in both the Edson and Grande Prairie forest areas and most sawmills are located in the Slave Lake area.

CULMINATION ACTIVITIES

At the completion of the activities related to the topic of ANIMALS AND PLANTS, the students should be brought together for a number of activities to evaluate learning and synthesize ideas.

Several activities for review and evaluation purposes are provided. However, teachers may wish to set a quiz or test of their own design and purpose.

Please Note:

The following activity can be completed independently by the children and then discussed in class. Xerox copies and distribute to students.

A. Completing a Glossary

Complete your own glossary by filling the blanks with the correct answer.

1. _____ - green colouring in plants.
2. _____ - taking care of our natural resources.
3. _____ - when birds and animals die off and no longer exist.
4. _____ - a mammal whose name comes from the French word for honey comb (gaufre).
5. _____ - location of a large pulpmill west of Edmonton.
6. _____ - a system of storing water by dams and carrying it to the fields through a system of canals, ditches, and pipes.
7. _____ - a process whereby the sunlight changes carbon dioxide and water into carbohydrates.
8. _____ - replanting of areas where forest fires or lumbering have removed the tree cover.
9. _____ - a place where wild birds can live and nest unharmed.
10. _____ - an example of a deciduous tree which is also called Eastern Larch.
11. _____ - floral emblem of Alberta.
12. _____ - the material used to produce cellophane, plastics, turpentine.

CHOOSE FROM THESE WORDS

wood	irrigation	extinction	tamarack
chlorophyll	Hinton	reforestation	rose
gopher	conservation	photosynthesis	sanctuary

ANSWERS:

- | | | | |
|-----------------|---------------|-------------------|--------------|
| 1. chlorophyll | 4. gopher | 7. photosynthesis | 10. tamarack |
| 2. conservation | 5. Hinton | 8. reforestation | 11. rose |
| 3. extinction | 6. irrigation | 9. sanctuary | 12. wood |

B. Valuing Discussions and Activities

The suggested activities will be a variety of independent work and small and large group discussions.

Small Group Discussions:

Divide the children into groups of 4 or 5 and have them discuss one of the following issues. Have each group appoint a recorder and a spokesperson who will report to the teacher or the larger group. The recorder can record the main points in point form on a chart which can later be posted.

1. Alberta's forests have been called "green gold." What do the words mean? Should Albertans consider forests as green gold? Why? Why not?
2. Albertans are justified in cutting timber and producing the many products they need. They do not have to worry about having a supply of timber in the future. Do you agree? Why? Why not?
3. Animals and birds do not need to be protected in sanctuaries or national parks. There are plenty of birds and mammals living in Alberta.

Large Group Discussions:

Have the entire class together to discuss an issue of contemporary importance.

1. Value Sheet

A value sheet is a short excerpt or article which presents a moral issue or dilemma. As an example, use excerpt 15 as the basis for a discussion concerning the conserving of natural resources (the buffalo) which is not a highly economical resource to Albertans but does add to Alberta's overall asthetic and natural beauty.

2. Taking a Stand

The teacher or students select a controversial issue - something that people have a strong feeling about. Then each student writes a slogan about that issue on a sheet of construction paper or cardboard. Students then hold a demonstration by walking around the room carrying their signs above their heads so everyone can read them. After the demonstration, the signs are posted around the classroom. A discussion of the issue follows.

✓3. Baker's Dozen

Ask the students to list 13 things around the home which make use of wood and wood products. Next have them draw a line through three things each one could live without the easiest. Draw circles around three items which are precious. These would be the last items each child would be willing to give up. Ask children to share list of circled and crossed out items and explain their choices. A lively discussion should follow.

Individual Activities

As a follow-up to a large or small group discussion, an individual activity might be introduced.

1. I learned statements

Right after a values activity or discussion, the teacher asks the students to think for a minute about what they have learned or re-learned about themselves or their values. Then they are to use any one of the sentence stems to share with the group one or more of their feelings. The teacher prepares a chart with the following (or similar) sentence stems:

I learned that I _ _ _ _ _

I realized that I _ _ _ _ _

I re-learned that I _____
I was surprised that I _____
I was displeased that I _____
I was pleased that I _____

2. I wonder statements

Upon completion of a values activity or discussion, the teacher asks students to complete in writing, sentences beginning with "I wonder" such as:

I wonder if _____
I wonder why _____
I wonder whether _____
I wonder about _____
I wonder when _____

The teacher should participate, too, and might even start off with an example. There is no discussion of the questions raised since the goal is to stimulate thought (possibly about the future of Alberta's natural resources).

MINERALS OF ALBERTA

NOTES TO THE TEACHER


INTRODUCTORY ACTIVITY - Map Exercise


All students should complete the map exercise at the same time. Give each child one copy of the map and one copy of the question sheet. (These are located in Student Master Section, Student Master #13 and #14, pages 137 and 138). Direct the students to study the map carefully and to answer each question by themselves.

ANSWERS FOR MAP EXERCISE


1. 1975


2.  iron

 sodium sulphate

 dolomite

 salt

 silica sand

 gypsum

3. Saskatchewan

4. British Columbia

5. silica sand, clay and shales, marl or salt

6. bentonite, iron, salt

7. bentonite, clay and shales

8. bentonite, calcium magnesium brines, marl, clay and sales, and salt

9. salt

10. gypsum

11. silica sand, limestone, gypsum, salt, cadmium, nickel, titanium or zirconium
12. Salt
13. Limestone
14. calcium magnesium brine
15. Lloydminster
16. Banff
17. Edmonton
18. Peace River
19. Rocky Mountains

INDEPENDENT STUDENT INQUIRY

At this point in the unit, the students will be involved in independent student inquiry. They will be using task cards which will direct them to do some individual research so that they will have a better understanding of what Alberta's minerals are like and what they are used for.

The tasks included on the following pages should be put on cards. A duplicate set would be useful as there would always be extra cards for the children to choose from. It is not necessary for all of the children to complete each and every card to gain an understanding about Alberta's minerals.

Since most of the cards require the use of encyclopædia and dictionaries, have the children work in the school library so that these

reference books are readily available. A copy of the map used in the introductory part of this section should be available so that the children can locate any places mentioned on the task cards. Copies of the Alberta book by Don Barnett and Pat Mogen are also necessary. One task card (number 22, p. 434) also requires the use of plaster of paris and water.

The task cards could be set up in a box. It is not necessary for the students to do the cards in order. A record sheet that can be marked off by the teacher to show successfully completed cards would be useful. The children should complete one card, have it checked by their teacher or the librarian and then they can begin another card. Approximately 3 to 4 sessions (one hour in length) would be necessary for the children to complete sufficient cards to gain an understanding of Alberta's minerals. All answers for the cards should be recorded in the student's own scribbler.

Please Note:

All of the student activities appear as STUDENT ACTIVITY OR TASK CARDS on pages 417 through 434, and are prepared in such a way they can be easily mounted and laminated for student use. There are no excerpts for the Mineral Station.

The answer key, following immediately, provides answers to questions on STUDENT TASK CARDS.

MINERALS: ANSWER KEY

Please Note:

Answers will likely vary depending on which encyclopædia or reference books are used.

Task Card Number 1 (p. 418)

1. Minerals are naturally occurring substances which come from the earth and are used in most industrial processes.
2. ANSWERS WILL VARY - A mineral is a substance obtained by mining.
3. ANSWERS WILL VARY.

Task Card Number 2 (p. 418-421)

1. ANSWERS WILL VARY
2. They could trade such items as furs.
3. They did not know that other minerals existed and they had no use for them.
4. ANSWERS WILL VARY.

Task Card Number 3 (p. 422-423)

1. Salting or smoking the food
2. Buildings, wells, streets, sidewalks, chimneys, windows, morrors, etc.
3. ANSWERS WILL VARY
4. ANSWERS WILL VARY

Task Card Number 4 (p. 424)

1. limestone, shale, gypsum, clay, silica sand and salt
2. limestone, shale, gypsum
3. All of them are non-renewable resources. Once they are used they cannot be used again.
4. pottery, porcelain ware, bricks, glass, fibreglass
5. salt

Task Card Number 5 (p. 424)

1. So that the limestone can be transported to other centres.
2. It will go to factories that make cement.

Task Card Number 6 (p. 425)

1. Land will be carved away, grass and trees will be removed, large machines will be noisy, pollution from the plant may result in poor water supply and smoke in the air, etc.
2. ANSWERS WILL VARY

Task Card Number 7 (p. 425)

1. Limestone is loaded into a crusher where it is crushed to small pieces. It is then mixed with clay or shale. After being put into a whirling mill, it is ground into a powder. The powdered cement is then put into a roasting kiln. The particles of cement react chemically to form new compounds called clinkers. The clinkers are cooled in long cooling tanks. Gypsum is added and the clinker is ground until it is very fine. The cement is then packaged in sacks.
2. Cement is used to make concrete which is used to make buildings, roads, sidewalks, dams and bridges.

Task Card Number 8 (p. 426)

1. e.g. construction - mortar, cement, whitewash
tanning and farming - hair remover in tanning, fertilizers and
fungicides
manufacturing - glass, sugar refining, cast iron
medicine and bleaches
water purification
2. ANSWERS WILL VARY

Task Card Number 9 (p. 426)

1. Limestone is a type of rock made up mostly of calcium carbonate.
It is usually a grayish colour but other colours have been
found.
2. Scientists pour diluted hydrochloric or sulphuric acid on the
limestone. If the substance is limestone, it gives off bubbles
of carbonic gas.

Task Card Number 10 (p. 427)

1. ANSWERS WILL VARY
2. ANSWERS WILL VARY

Task Card Number 11 (p. 427)

1. Gravel is put between the railway tracks to keep weeds under
control and to keep the soil in place so it will not wash away.
2. ANSWERS WILL VARY

Task Card Number 12 (p. 428)

1. heat insulation, glass yarn, tape, cloth, mats, fire-fighter's
suits, curtains, automobile bodies, etc.
2. ANSWERS WILL VARY

Task Card Number 13 (p. 428)

1. Alberta may not have enough to meet all of the demands for it or the imported sand can be of a better quality.
2. ANSWERS WILL VARY

Task Card Number 14 (p. 429)

1. Clay is the kind of earth made up of extremely fine particles. Clay is smooth and when wet it becomes a sticky, slippery mud. Dry clay does not hold together well and is easy to turn to powder or dust. Most clay is colored by other minerals. Shale is of the same material as clay but harder. It is a sedimentary rock found in layers.

Task Card Number 15 (p. 429)

1. Sandstone is a kind of rock made of grains of sand naturally cemented together. It can be of different colours from white to dark gray or brown.
2. Buildings, making glass
- 3 ANSWERS WILL VARY

Task Card Number 16 (p. 430)

1. It means that salt is mixed in water. Water is forced down to the salt beds which are located below the surface of the earth. The resulting salt-water mixture is refined until the water is removed leaving only salt behind.
2.

seasoning for food	food processing
chemical industries	meat packers
hide and leather processing	soapmaking
glass industries	ice and refrigeration industries
etc.	

Task Card Number 17 (p. 431)

1. It means that we have enough known supplies of sodium sulphate so that there will be lots for future use.
2. ANSWERS WILL VARY

Task Card Number 18 (p. 432)

1. Sulphur is pale yellow in colour, though it may sometimes be greenish, brownish or reddish. Sulphur is brittle and has almost no taste. It gives off a peculiar odour when it is rubbed or melted.
2. gunpowder, matches, fertilizers, insecticides and plant medicines, photography, rubber, etc.

Task Card Number 19 (p. 432)

1. Dolomite is a mineral composed of carbonates of calcium and magnesium. It is moderately soft, and is coloured milky-white, brownish or pink.

Uses - in buildings, to line Bessemer furnaces, to make Epsom salts, etc.

2. ANSWERS WILL VARY

Task Card Number 20 (p. 433)

1. Marl is the name for several different kinds of clay mixtures. It usually contains clay, sand and calcium carbonate. It is used as a fertilizer. It helps to increase the supply of plant food and it improves the texture of the soil.

Task Card Number 21 (p. 433)

1. ANSWERS WILL VARY

Task Card Number 22 (p. 434)

1. ANSWERS WILL VARY
2. ANSWERS WILL VARY
3. Fertilizer, paint, filters, insulation, wall plaster

CULMINATION ACTIVITIES

A. Independent Activity

Have the children complete the following questions:

1. A mineral is a (renewable/non-renewable) natural resource.
2. I think minerals are a (renewable/non-renewable) natural resource because _____.
3. Write down the items that you think are minerals:

cows	soil	electricity	clay	salt
birds	sulphur	parks	limestone	silica sand
iron ore	trees	gypsum	rainfall	shale

B. Large Group Activity

Bring the children back into a large group. On the blackboard, place a large sign reading MINERALS ARE NON-RENEWABLE RESOURCES. Have the children justify to you that this statement is true. Each time they give a valid reason write it on the blackboard. Once this has been completed, continue the discussion but look at the problem that Albertans could face if they use their supply of minerals unwisely. Finally, lead the discussion into giving suggestions for conservation of Alberta's mineral resources.

CULMINATING ACTIVITIES

When students have completed sufficient activities at all five stations - Land, Water, Fossil Fuels, Animals and Plants, and Minerals, plan for several activities to assist students to synthesize their learning experiences and check understandings prior to beginning the final stage of application and action.

ACTIVITY ONE - Checking Hypotheses

Please Note: This activity should be done by all pupils.

Have children look at their original hypothesis developed at the beginning of the unit. By now, they should have more reasons to justify their hypothesis and should rewrite their position based on the information they now have.

Some students may wish to change their original position and develop a new hypothesis.

Have students mount their "revised" hypotheses on coloured paper and post them on the bulletin board.

Discuss why some changed their hypothesis; why others stayed with their original hypothesis.

1. What made you change your hypothesis?
2. What information did you discover?
3. Why are you staying with your original hypothesis?
4. Will you hold your present position for long? Why? Why not?

ACTIVITY TWO: Video Cassette

A thirty minute video cassette entitled Alberta Resources Review is available from ACCESS. The video provides an overview of the various resources available in Alberta. A copy of this cassette for your school library may be obtained by sending a blank tape to ACCESS.

ACTIVITY THREE: The Alberta Resources Game

Copies of the game can be xeroxed and laminated for students' use. Divide the class into groups of three and provide each group of three with the question cards and "board". Have each group keep a record of their progress and declare a winner at the end of a specified time.

Please Note:

The game can be added to with additional items entered on the cards. Game is located in the Student Master Section and is Student Master #15 and #16, located on pages 142 to 147.

ACTIVITY FOUR: Retrieval Chart

- A. Provide students with a list of natural resources and a copy of the retrieval chart. Have students classify each resource as renewable or non-renewable in the retrieval chart. Tell students they will be

expected to defend their classifications.

Please Note:

The list of natural resources can be expanded to include aspects of the unit study covered by students. It can be given to students, written on the blackboard or an overlay.

B. Have students complete the sentences:

(i) "Renewable Resources are alike in that they _____

(ii) "Non-renewable Resources are alike in that they _____

C. Have students tell in their own words how they think Albertans should use their natural resources.

"I think that Albertans should _____

LIST OF NATURAL RESOURCES

wind	sunshine	flowers
coal	elk	soil
balsam fir	rain	clay
mountain lake	water	oil sands
dolomite	forests	natural gas
oil	marl	white spruce
fish	gravel	sand
snow	lignite	precipitation

[illegible]

ACTIVITY FIVE: Experience Chart

Write another experience chart with the students explaining in more detail what natural resources are and what renewable/non-renewable resources are. Ideas similar to the following should be brought out:

1. Natural resources are something provided by nature and have value to human beings.
2. Any natural feature becomes a resource when people use it to supply their needs or serve their wants.
3. It is human intelligence that creates uses for natural resources.
4. The value of resources depends on people: it depends on people's ability to use resources as well as their desire to put them to use.
5. Modern people use many more natural resources than did their ancestors and they use them in greater amounts.
6. Technology and the space age have increased people's needs for natural resources.
7. Not all provinces or countries are equally rich in natural resources.
8. The location of a natural resource is important: e.g., is it near transportation or markets?
9. People have the ability to modify their environment and improve their resources (e.g., irrigation).
10. People can change their environment so that resources are reduced in value or even destroyed (erosion, water pollution).
11. The natural resources of provinces affect their economic and political influence in Canada and the world (e.g., stimulates trade).

ACTIVITY SIX - Identifying Problems

List in chart form all the problems related to the use and conservation of Alberta's natural resources. Have them try to verbalize possible solutions to the problems. Point out that some of their solutions may not be feasible and can they think of alternative solutions. Ask them what they personally would be willing to do to solve a problem.

APPLICATION ACTIVITIES

RESOLVING AN ISSUE AND TAKING ACTION

Overview:

Upon completion of the station and culminating activities, students should understand the issues underlying the major focus question "How Should Albertans Use Their Natural Resources?" The question now arises whether students have made certain value commitments which would lead them to take some action. Several activities can be undertaken to create an awareness that the INDIVIDUAL CAN DO SOMETHING!

ACTIVITY ONE: Read a Story

Read a story or newspaper article to the students in which someone does take action on an issue related to a natural resource. Check Environment Views, or Canadian Children's Magazine for possible items. The following book is an excellent example portraying how an individual can become involved in stemming the pollution in a neighbourhood.

Leaf, Munro Who Cares I Do? New York: J. B. Lippincott, 1971

ACTIVITY TWO: I Learned Statements

Prepare a chart with the following (or similar) sentence stems. The chart may be posted for the remainder of the unit or just when it is used.

1. "I realize that I must do _ _ _ _ _."
2. "I discovered that I am _ _ _ _ _."
3. "I learned that Albertans _ _ _ _ _."
4. "I was surprised that natural resources _ _ _ _ _."

Students can use any one of the sentence stems to share with a small or large group. Statements should be kept short and to the point so that the discussion flow is not interrupted.

ACTIVITY THREE: Values in Action

This strategy focuses on the action side of valuing. It helps students see alternatives for action and asks them to find some form of action that suits them. Finally, the strategy requires students to actually engage in a planned action to bring about some desired change and then evaluate the results of their actions.

Ask students to make a list of five changes they think would improve Alberta's use of their natural resources. Or the teacher may provide the class with a list of issues and ask them to describe five changes which they would like to see made in any of these areas.

Pass out the *"You Can Do Something About It"* worksheet p. 98 to each student. Students complete the form by putting a check beside any of the alternatives which they have done and a star next to any of the alternatives they would consider doing.

Ask each student to select one of their five

changes and identify which types of action could be used to work toward the change they want to effect. Finally, each student is to select two types of action and for a period of one week (month) actually engage in both of these actions to bring about the desired change. A week (month) later, the class members discuss what they did and what results, if any, occurred.

WORKSHEET

"YOU CAN DO SOMETHING ABOUT IT"

NAME.....

Most of us when we see something wrong want to try to do something about it. Often, however, we do not know what we can do. Below are some things people have done to achieve desired changes. Which of these acts is your way of doing something?

- _____ 1. Write a letter to the editor of your newspaper describing or telling about a pollution or conservation issue in your community. People read these columns more frequently than almost any other section of the daily paper. You can influence public opinion.
- _____ 2. Write a letter to your MLA or M.P. Compliment them for something they have done about a problem with a natural resource that you are concerned about.
- _____ 3. Send a letter to someone in the news who has done something about conserving natural resources and whom you respect or admire.
- _____ 4. Write one of the organizations working for a cause you believe in and ask to be put on the mailing list (e.g., Environment Views, Greenpeace).
- _____ 5. Ask your teacher and principal to have a meeting or invite a guest speaker on a topic concerning the use of a natural resource which deeply concerns you.
- _____ 6. Wear a button which tells how you feel about an issue related to natural resources.
- _____ 7. Speak up for your point of view with friends and family members. Explain how you feel about Alberta's natural resources.
- _____ 8. Distribute pamphlets or leaflets which describe any issue related to natural resources.

WORKSHEET

"YOU CAN DO SOMETHING ABOUT IT"

PAGE 2

_____ 9. Try to get your family to talk about how Alberta should use their natural resources. Alert them to becoming more conserving.

_____ 10. Try to close the gap between what you say and what you do. If you feel that Albertans should use their natural resources carefully, then you must try not to be wasteful and careless.

ACTIVITY FOUR: Example: "Using or Misusing Paper"

A. Identify the Problem

Conduct a class discussion with the students. Have them suggest the different ways paper is used in the classroom each day. List their ideas on the blackboard, overlay or Experience Chart.

Ask questions:

1. What kinds of paper do we use in the classroom? in the school?
2. How much paper does our class/school use in a day?
3. Does our class/school use too much paper? Is it necessary to use all the paper we do use?
4. Is our class/school careful how we use paper? Does our class/school use paper wisely? Why? Why not?

Finally, the teacher should try to have the students suggest that there might be a problem in the amount and kind of paper used in the classroom and school. Have them state the problem in their own words.

"Our class/school uses too much paper each day."

- OR -

"Our class/school uses its paper wisely."

B. Plan the Action

1. What Can We Do?

Divide the Class into groups of two or three. Ask each group to record answers to the following question:

- (a) What can we do to find out how much paper is used in the classroom and school?

Bring the class together to share their ideas. List the different suggestions on the blackboard or a chart. Suggestions might include:

- (i) Conduct an analysis of the wastebasket each day
- (ii) Talk to the school secretary
- (iii) Interview the janitor, asking how much paper he cleans up each day
- (iv) Keep a daily count of paper an individual uses
- (v) Keep a daily record of the paper used in the classroom
- (vi) Interview other teachers and classes
- (vii) Conduct a school survey

Help the students recognize which possible actions are feasible and desirable. Decide on which tasks will be carried out.

2. Dividing the Labour.

Divide the students into groups of three or four and have each group decide upon one or two tasks they will carry out to collect information. Suggest that each group also consider how they will record their information and report back to the class.

Sample Tasks:

- (a) Conducting an Interview (secretary, another teacher, janitor)

Suggest student make an appointment with one or all of the persons suggested and find out about the use of paper in

the school.

- (i) How much paper do you estimate is used in a day?
- (ii) What kind of paper is used the most? by whom?
- (iii) What does the paper used cost per day? per month? per year?
- (iv) Is it necessary to use the amount of paper presently used? What alternatives could be used?
- (v) Who pays for the paper?
- (vi) Are many sheets of paper wasted? How can you tell?
- (vii) Do you have any suggestions on how paper might be used more carefully?

(b) Wastepaper Basket Analysis

Have the students dump the contents of the classroom wastepaper basket and classify its paper contents:

- (i) by kinds of paper used
- (ii) by how the paper has been used (one side only, both sides, only a few words or part of a drawing, blank worksheets, etc.)

Have students count the different kinds and uses of paper and begin to keep a graph or table. The analysis could go on for several days.

WASTEPAPER BASKET PAPER

Kinds of Paper	Use of Paper
newsprint _____	used one side _____
coloured paper _____	used both sides _____
white paper _____	used very little of one side _____
art paper _____	not used at all _____
glossy paper _____	
cardboard paper _____	

(c) Personal Use Inventory

Have students keep a record of the paper each one in the group uses each day. They should record the kind of paper used, how many sheets or pages used, where and when the most is used, least is used, etc.

Instruct each member of the group to select one person in the class for observation. Ask the students to keep a tally on that person's paper use for an entire day, two days or any set time. Have them compare the results of their own usage with that of the observee.

WORKSHEET

USES OF PAPER

DATE: _____ NAME: _____

Today the following kinds and amount of paper were used:

Kind of Paper	Purpose	Number of Sheets
1. newsprint	reading worksheet	3
2. art paper	drawing a poster	2
3.		
4.		

(d) Conducting a Survey

Assist students in conducting a survey of the classrooms or school persons regarding the use of paper. A short questionnaire or checklist might be constructed which could then be distributed to classes throughout the school. The results could be tabulated and displayed in graphs, numbers and charts. A short paragraph could follow in which the students attempt to interpret the results. An example of a checklist which could be used for survey purposes is enclosed.

(e) Assistant Junior Janitors

Make arrangements with the "kindhearted" school caretaker for a group of children to accompany him on his rounds when he picks up the garbage for the day. Supply the students with Polaroid cameras and sketch pads. Instruct the children to take pictures of the amounts of paper found in the trash. Pictures could be taken of classrooms at the end of a day showing the scraps of paper on floors and desks; of wastebaskets overflowing with paper; of the total paper taken to the incinerator; of the xerox or ditto work room and other places around the school where paper would be in constant use. Instruct students to write impressions and descriptions of what they observed.

WORKSHEET

PAPER SURVEY

NAME _____

INSTRUCTIONS: Place a check in the box that most closely tells what you do. Try to be as honest as possible.

Yes No

- | | | | |
|-----|--------------------------|--------------------------|---|
| 1. | <input type="checkbox"/> | <input type="checkbox"/> | I use paper in school every day. |
| 2. | <input type="checkbox"/> | <input type="checkbox"/> | I always write on both sides of a sheet of paper. |
| 3. | <input type="checkbox"/> | <input type="checkbox"/> | I use the entire page of paper before I go onto the next sheet or page. |
| 4. | <input type="checkbox"/> | <input type="checkbox"/> | I use any paper I can find when I need it. |
| 5. | <input type="checkbox"/> | <input type="checkbox"/> | I use good paper for special tasks and poorer paper for rough work and scrap paper. |
| 6. | <input type="checkbox"/> | <input type="checkbox"/> | I think about the amount of paper I am using each day. |
| 7. | <input type="checkbox"/> | <input type="checkbox"/> | I throw away a sheet of paper whenever I make a mistake. |
| 8. | <input type="checkbox"/> | <input type="checkbox"/> | I do not use more paper than I need. |
| 9. | <input type="checkbox"/> | <input type="checkbox"/> | I can always get more paper when I need it. |
| 10. | <input type="checkbox"/> | <input type="checkbox"/> | I use each page in my scribbler before I get a new scribbler from the cupboard. |
| 11. | <input type="checkbox"/> | <input type="checkbox"/> | I think I should be more careful about the amount of paper I use. |

Estimate the number of sheets of each
kind of paper you use today.

newsprint	_____
white sheets	_____
coloured paper	_____
cardboard paper	_____
scribbler pages	_____
Total:	_____

THANK YOU FOR YOUR HELP!



Set aside a period or a day for the different groups to compile their results and plan how they might share their findings with the other groups. Once the groups are ready, provide time for each group to share with the other what they found out. Have each group post their results for all to see. Conduct a discussion at the end of sharing time:

1. What do we now know about the use of paper in our school?
2. What generalizations can we state about the use of paper?
3. Is there a problem here? If so, what is the problem?
4. What can we do with our information? Who can we talk to?
5. What ACTION can we take?

C. Carrying Out the Action

On an experience chart or blackboard, list the different suggestions students offer as to possible actions. The teacher should accept only those actions which are feasible and useful under the time and capability constraint of the school situation. Some of the actions suggested by the students (and subtly by the teacher) might include:

1. A bulletin board display in the front school hallway for all to see.
2. A presentation at a school assembly.
3. A meeting with the principal(s) to share the results.
4. A report with photographs and charts in the school or local community newspaper.
5. Forming a "Save the Paper" club with directions to continually remind the class and school about the careful use of paper.

6. The design of a pamphlet or leaflet (illustrated with charts and photographs) telling about the problem. These could be distributed to key people in the community.
7. Keeping a personal inventory on paper use and graphing the results for the remainder of a year trying to show a decrease in usage.
8. Making up a class (school) list of rules for how paper should be used.

The students can be placed back into their working groups and instructed to choose one of the suggested actions and carry it out. Each group should identify the materials they need, divide the work, and submit a daily report to the teacher. Approximately two to three days might be set aside to complete the tasks.

D. Evaluate the Action

Various strategies can be used to evaluate the actions taken by the students. Both individual and group evaluations might be undertaken. Several suggestions are given but other strategies can be employed.

1. Group Discussion

Bring the children together and have them react to the following questions. You may wish to begin with personal statements followed by a large group discussion.

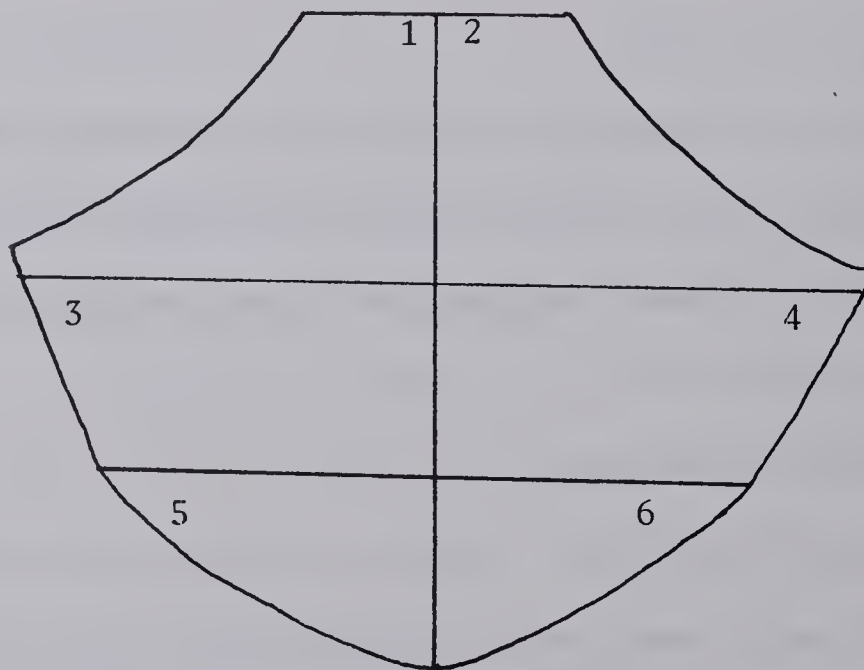
- (a) Do other people in the school know about the paper problem?
How can you tell them?
- (b) Has anyone talked to you about what you found out about the paper problem?

- (c) Has your action made any impact on the amount of paper used?
How can you tell?
- (d) Will you carry out the action again?
- (e) What will you remember for the future?

2. Personal Statements

(a) Personal Coat of Arms About Paper

Either give the children a facsimile of the coat of arms (below) or have them copy the coat of arms. The students are to answer each of the following questions by drawing, in the appropriate area on their coat of arms, a picture, design, symbol or word(s).



- (i) What is the most important thing you learned from the study of paper use?
- (ii) If you could make a change in the school's use of paper, what would it be?
- (iii) What would you like to change about your own way of using paper?

- (iv) If you were the teacher or principal in the school, what would you do to conserve paper?
- (v) Why do you think it is important to conserve and use paper carefully?
- (vi) What personal motto regarding the use of paper will you live by?

(b) Unfinished Sentences

Provide students with a list of unfinished sentences. Students write out their own sentences with their own thoughts. The completed sentences can be dealt with in the following ways:

- (i) Students write out sentences and then break into pairs or trios and discuss their finished sentences.
- (ii) Students complete sentences and file them away for future reference or discussion.
- (iii) Students write out their sentences and then code their completed sentences in one or more of the following ways:
 - place "p" in front of those items of which you are proud
 - place "tc" in front of those items which you have thoughtfully considered
 - place "a" in front of those items which you have already acted upon or are willing to act upon
 - place "pb" in front of those items which are or will be a pattern of behaviour in your life.

Examples of unfinished sentences:

- (i) I feel best when people use paper . . .
- (ii) Some people seem to want only to . . .
- (iii) I believe . . .

- (iv) I get angry when . . .
- (v) I need to improve my own action in . . .
- (vi) I am concerned most about . . .
- (vii) The thing that scares me about using too much paper is . . .
- (viii) When I grow up I will . . .
- (ix) If I could make a new rule I would . . .
- (x) I think everybody in the school . . .

3. Pattern Search

Ask the students a question about one possible pattern in their lives. For example, "Do you go to church out of compulsion? out of habit? or because you feel it is a good thing to do?" Be sure the students understand the three patterns of behaviour. After a short discussion, give the students a Pattern Grid, as shown.

The teacher can provide a list of items for the pattern grid or students can write in their own items. Students are then instructed to check the appropriate boxes on the grid. They may break into small groups and choose one of the items to discuss for ten minutes after which they move on to another item and another group.

Please Note:

The final evaluation activities might now be used to complete the unit study.

APPENDIX

CALCULATING SCORES FOR THE SEMANTIC DIFFERENTIAL INSTRUMENT

SEMANTIC DIFFERENTIAL

Semantic Differential is an instrument designed to test students' attitude toward a specific concept, person or thing.

1. Designing the Instrument

- (a) Select a concept you wish to test the students' attitude toward.
- (b) Select a series of adjective pairs and set them out with five (or seven) spaces between them. Usually between five and ten adjective pairs should be selected per concept.
- (c) Arrange the adjective pairs with mixed ends (i.e., a mixture of positive and negative).
- (d) Administer the instrument.

2. Calculating and Interpreting the Results

- (a) Class averages and not individual are calculated. A class average (mean) is calculated for each continuum (adjective pair).
- (b) To calculate the class average (mean)
 - (i) assign a value of one to five for each of the five spaces between an adjective pair. The positive side receives the highest rating. For example:

SOCIAL STUDIES

very important 5 4 3 2 1 unimportant

- (c) For each continuum, total the number of students who marked each space and multiply their total by the value assigned to the space.

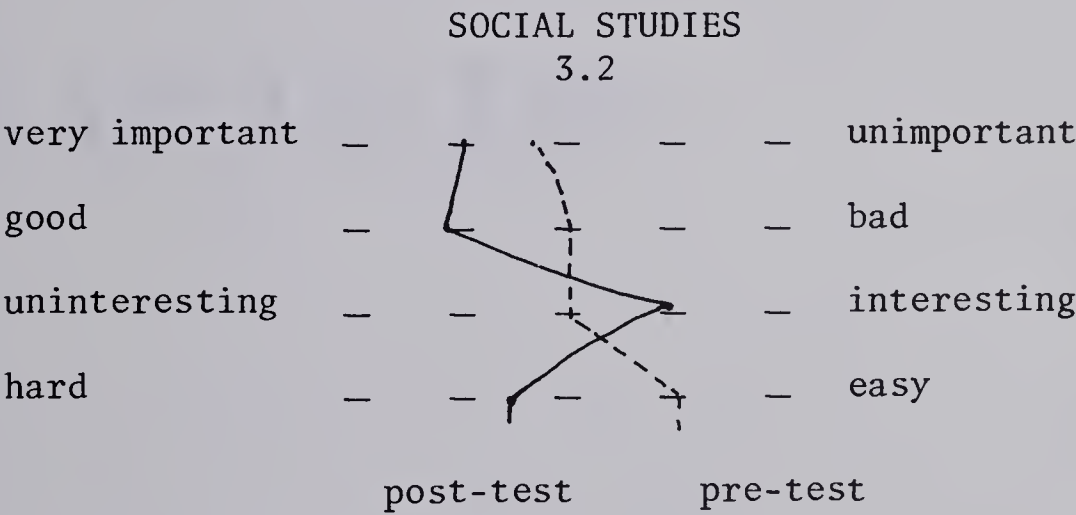
For example:

2 students marked space 1	=	value of 2
3 students marked space 2	=	value of 6
6 students marked space 3	=	value of 18
7 students marked space 4	=	value of 28
2 students marked space 5	=	value of 10

- (d) Total the values: 2 + 6 + 18 + 28 + 10 = 64
- (e) Divide the total by the number of students to calculate the average (mean) value for the particular continuum

$$64 \div 20 = \underline{\underline{3.2}} \text{ mean value}$$

- (f) Calculate the mean value for each continuum (or adjective pair) in similar fashion.
- (g) Chart a class profile (at pre-test and post-test times) to indicate changes in attitude of the students toward the concept measured. For example:



STUDENT MASTERS

Student Master #1

ALBERTA'S NATURAL RESOURCES

Name _____

Instructions: Complete each sentence in your own words.

1. A natural resource is _____

2. A renewable natural resource is _____

3. A non-renewable resource is _____

4. (a) Circle those items in the list below which you think are natural resources.
(b) Underline those items in the list below which you think are renewable natural resources.

rocks	grass	oil	cabin
dirt	water	horses	scissors
cars	house	tractor	soccer ball
telephones	sunshine	rain	spruce trees
apples	wind	river	fishes

5. (a) Pre-test:

What would you like to find out about natural resources? State one or two questions below.

- (b) Post-test:

What did you find out about natural resources? State one or two ideas below.

- | | | | | | | | | | | | |
|----|---------------|-------|---|-------|---|-------|---|-------|---|-------|--------------|
| 1. | important | _____ | : | _____ | : | _____ | : | _____ | : | _____ | unimportant |
| 2. | useless | _____ | : | _____ | : | _____ | : | _____ | : | _____ | useful |
| 3. | good | _____ | : | _____ | : | _____ | : | _____ | : | _____ | bad |
| 4. | not valuable | _____ | : | _____ | : | _____ | : | _____ | : | _____ | valuable |
| 5. | uninteresting | _____ | : | _____ | : | _____ | : | _____ | : | _____ | interesting |
| 6. | necessary | _____ | : | _____ | : | _____ | : | _____ | : | _____ | unnecessary |
| 7. | abundant | _____ | : | _____ | : | _____ | : | _____ | : | _____ | not abundant |
| 8. | not precious | _____ | : | _____ | : | _____ | : | _____ | : | _____ | precious |

9.	available	_____	:	_____	:	_____	:	_____	:	_____	not available
10.	wasted	_____	:	_____	:	_____	:	_____	:	_____	not wasted
11.	limited	_____	:	_____	:	_____	:	_____	:	_____	unlimited
12.	to be used	_____	:	_____	:	_____	:	_____	:	_____	to be conserved

TEACHER'S CHECKLIST NO. II - SOCIAL, RESEARCH AND MAP SKILLS

Names of Students

Social Skills

1. Accepts role of leader or follower
2. Ability to co-operate in a group
3. Ability to work independently

Map Skills

1. Notes directions
2. Locates places
3. Interprets map symbols
4. Makes inferences

Research Skills

1. Acquires information through listening and observing
2. Organizes information
3. Acquires information through reading
4. Writes with clarity

Communicating Skills

1. Expresses ideas clearly
2. Sticks to the topic
3. Listens to others
4. Contributes ideas to discussions
5. Speaks with accuracy and poise

Student Master #5

STUDENT SELF-EVALUATION

HOW WELL DID I DO?

Name _____

Instruction for students:

Read the statements below and give yourself a mark from one to five depending on how well you did. For example, for the statement "I listened closely," if you always listened closely to your teacher and other members of your class during lesson discussions give yourself five points by circling the number 5. If you listened closely most of the time circle the number 3. If you did not listen closely, circle the number 1. Remember circle only one number for each statement. Total your points by adding your circled numbers.

1. I listened closely.

1 2 3 4 5

2. I followed directions.

1 2 3 4 5

3. I was co-operative.

1 2 3 4 5

4. I worked quietly.

1 2 3 4 5

5. I worked at my own (or group) job until it was finished.

1 2 3 4 5

6. I took an active and interested part in the lesson.

1 2 3 4 5

7. I was respectful of others opinions and rights.

1 2 3 4 5

*My total score for today's lesson is _____.

Student Master #6

GROUP SELF-EVALUATION

HOW WELL DID MY GROUP DO?

Name _____

Instruction for students:

Read the statements below and give your group a mark from one to five depending on how well your group did. For example, for the statement "We moved quietly into and out of our group," if your group moved very quietly give it five points by circling the number 5. If your group made some noise while moving, give your group three points by circling the number 3. If your group was very noisy circle the number 1. Remember to circle only one number for each statement. Total your points by adding your circled numbers.

1. We moved quietly into and out of our groups.

1 2 3 4 5

2. We worked quietly.

1 2 3 4 5

3. We all contributed ideas to our group discussion.

1 2 3 4 5

4. We stayed on the topic.

1 2 3 4 5

5. We respected the ideas and opinions of every group member.

1 2 3 4 5

6. All group members helped to complete our assignment.

1 2 3 4 5

*My group's score for today's lesson is _____.

This is what I think should happen to

Alberta's natural resources in the future

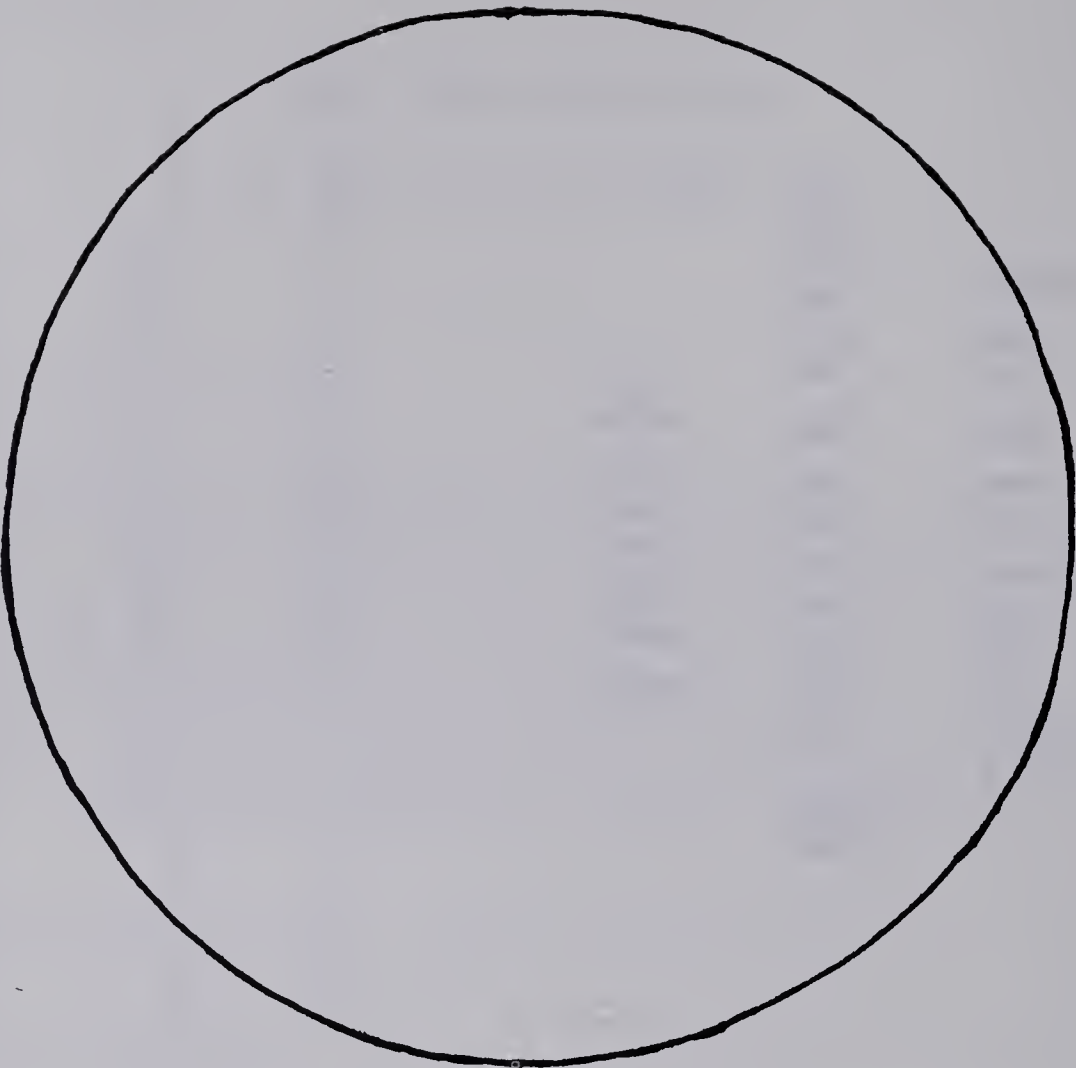
My Natural Resources Book

(Author)

(Published by, Location)

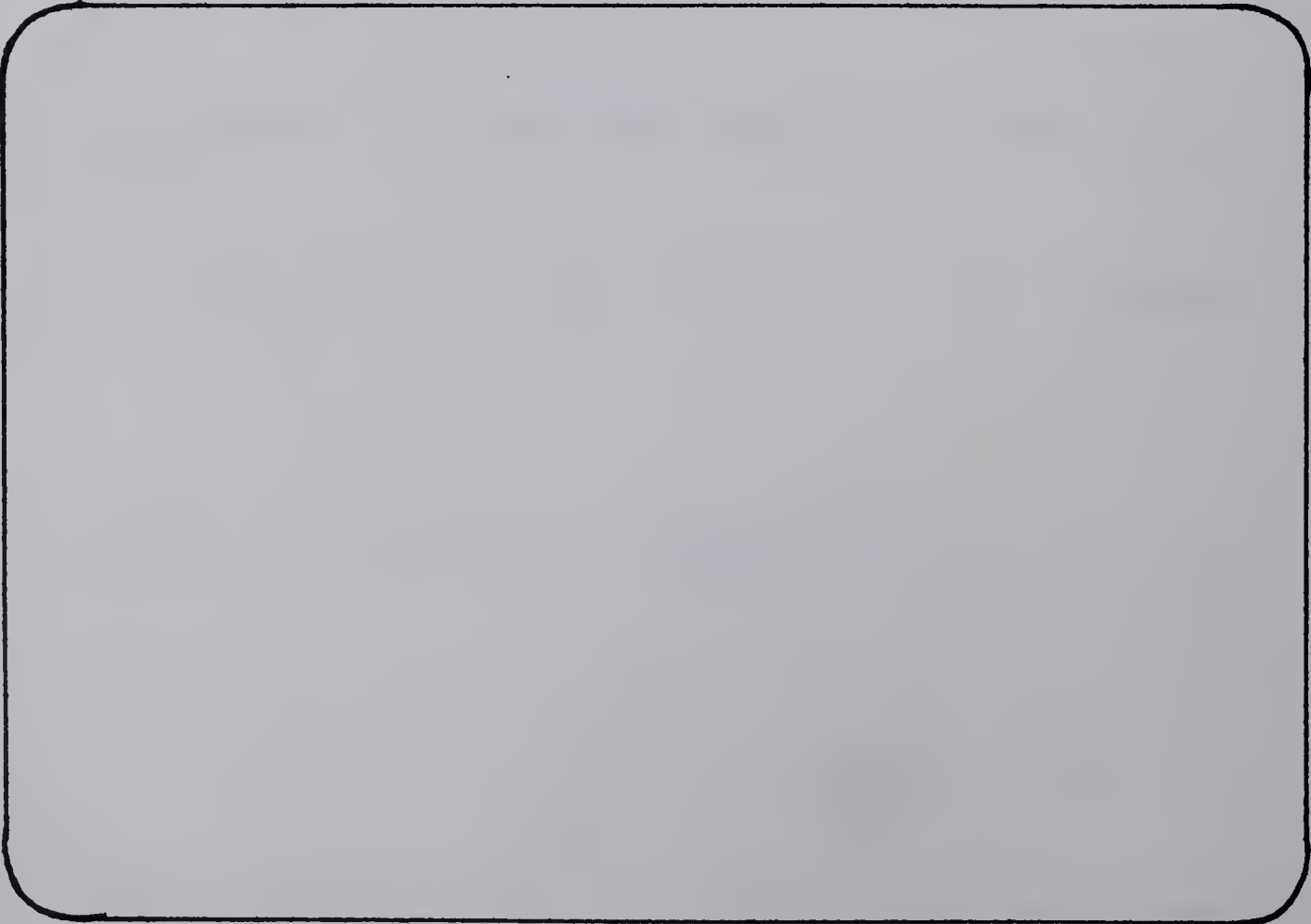
(Date of Publication)

This is an example of a



renewable resource

This is a problem I discovered about a

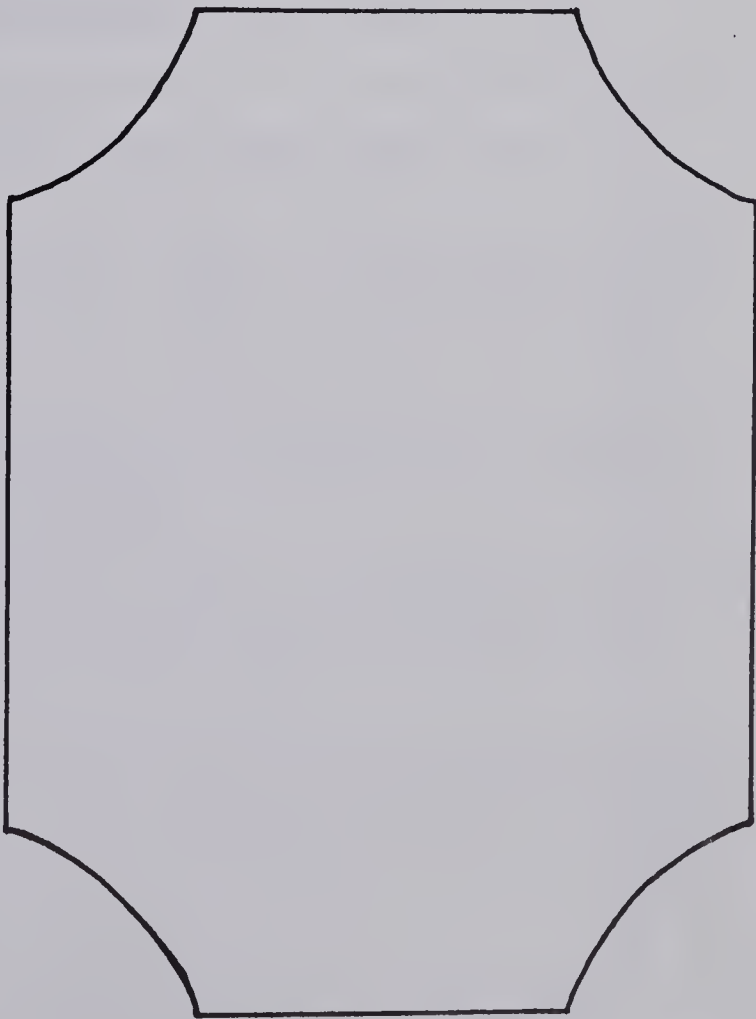


natural resource in Alberta

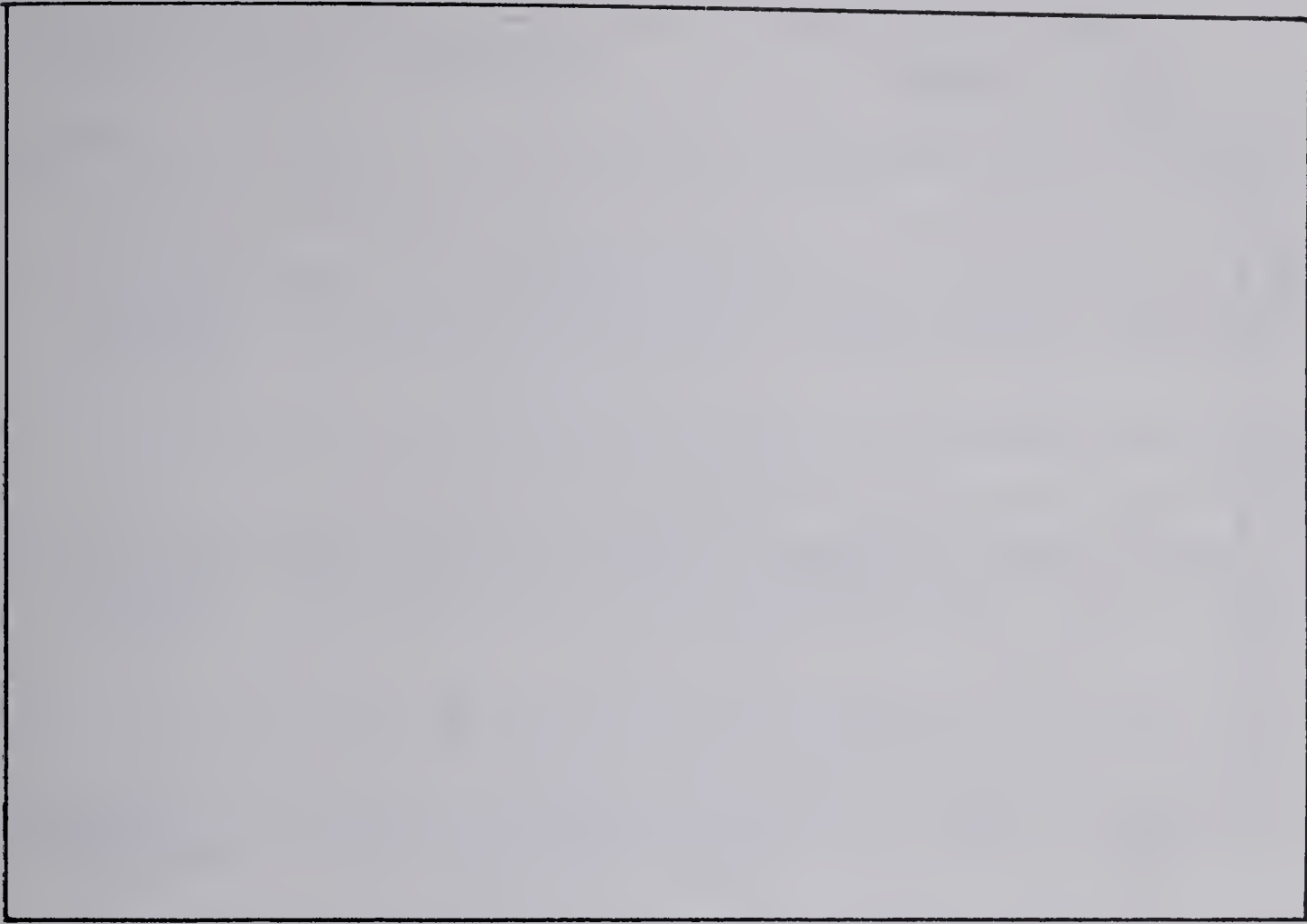
This is my favourite Alberta animal



This is my favourite Alberta plant



This is an example of a



non-renewable resource

This is the most important

A large rectangular box with a stepped border, intended for a drawing or illustration. The box is empty and occupies the central portion of the page.

natural resource to me

This is the most important

A large rounded rectangular box, intended for a drawing or illustration. The box is empty and occupies the central portion of the page.

natural resource to Albertans

Student Master #8

STUDENT INTEREST INVENTORY

Name _____

1. Did you enjoy learning about Alberta's Natural Resources?

2. Do you think it is important for us to learn about the natural resources in Alberta? Give reasons for your answer.

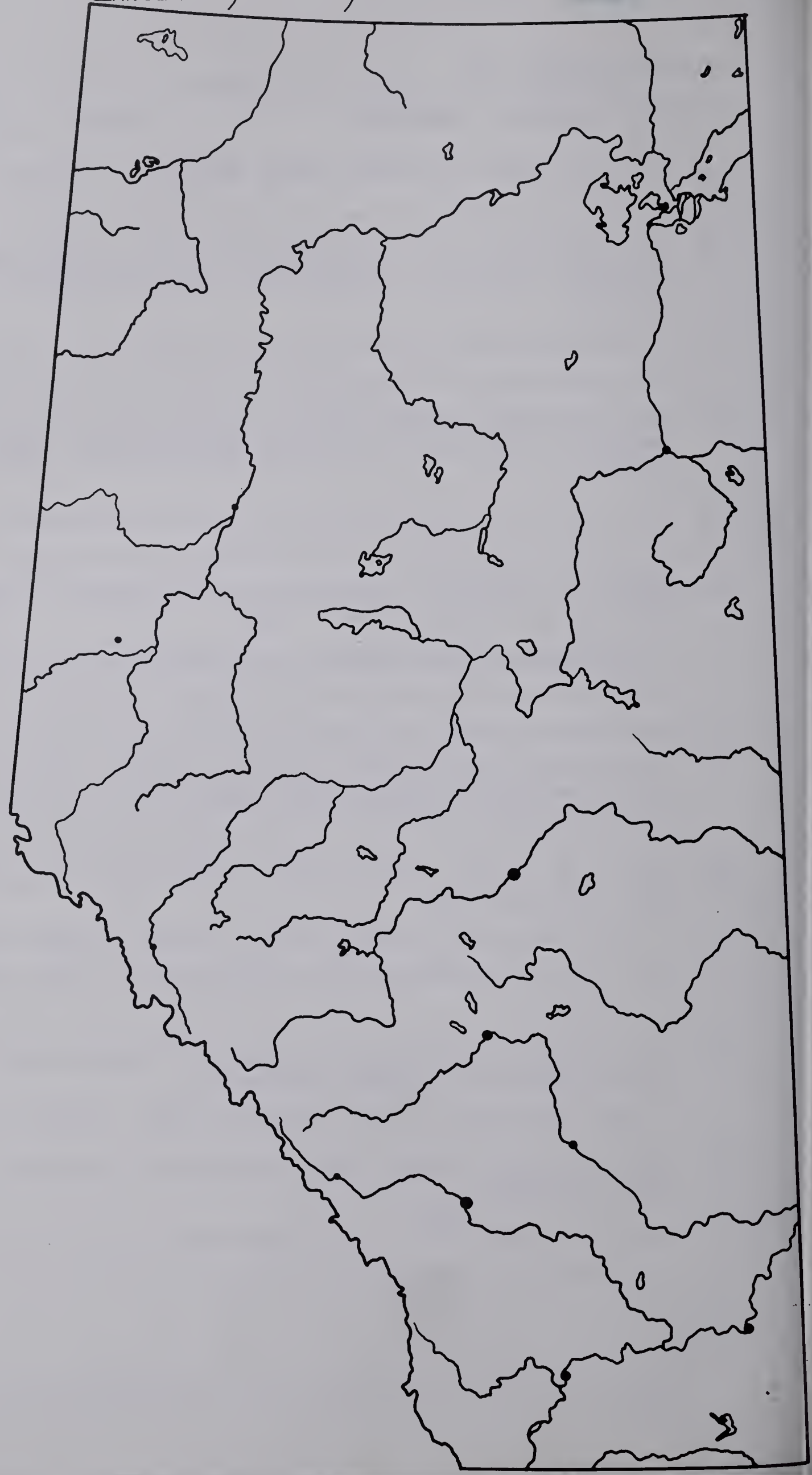
3. Do you think Alberta needs to conserve some of her natural resources for future generations? Why or why not?

4. Which of Alberta's Resources do you think is most important to the province? Why?

5. Do you know more about Alberta's natural resources now that you have studied about them?

6. Put an X on the station where you found the activities most interesting.
Land Minerals Water Fossil Fuels Plants and Animals
Tell why you preferred the activities at this station.

7. Put an X on the stations where you learned new things about Alberta's natural resources.
Land Minerals Water Fossil Fuels Plants and Animals
8. Did you prefer doing the activities by yourself or in small groups?
_____ Why? _____



Student Master #10

MAP EXERCISE - ALBERTA'S LAKES AND RIVERS

Name _____

1. Locate and mark the following towns and cities on your map of Alberta.

Edmonton	Medicine Hat	Jasper
Calgary	Grande Prairie	Banff
Lethbridge	Drumheller	Fort McMurray
Red Deer	Peace River	

2. Locate and mark in the following rivers on your map of Alberta.

Bow River	Red Deer River	Slave River
North Saskatchewan River	Peace River	Milk River
South Saskatchewan River	Athabasca River	Oldman River

3. Locate and mark in the following lakes on your map of Alberta.

Lesser Slave Lake	Wabamum Lake
Lake Athabasca	Lake Claire
Sylvan Lake	

4. Put in the directions north, south, east and west on your map. Also put in the directions northwest, northeast, southwest and southeast.

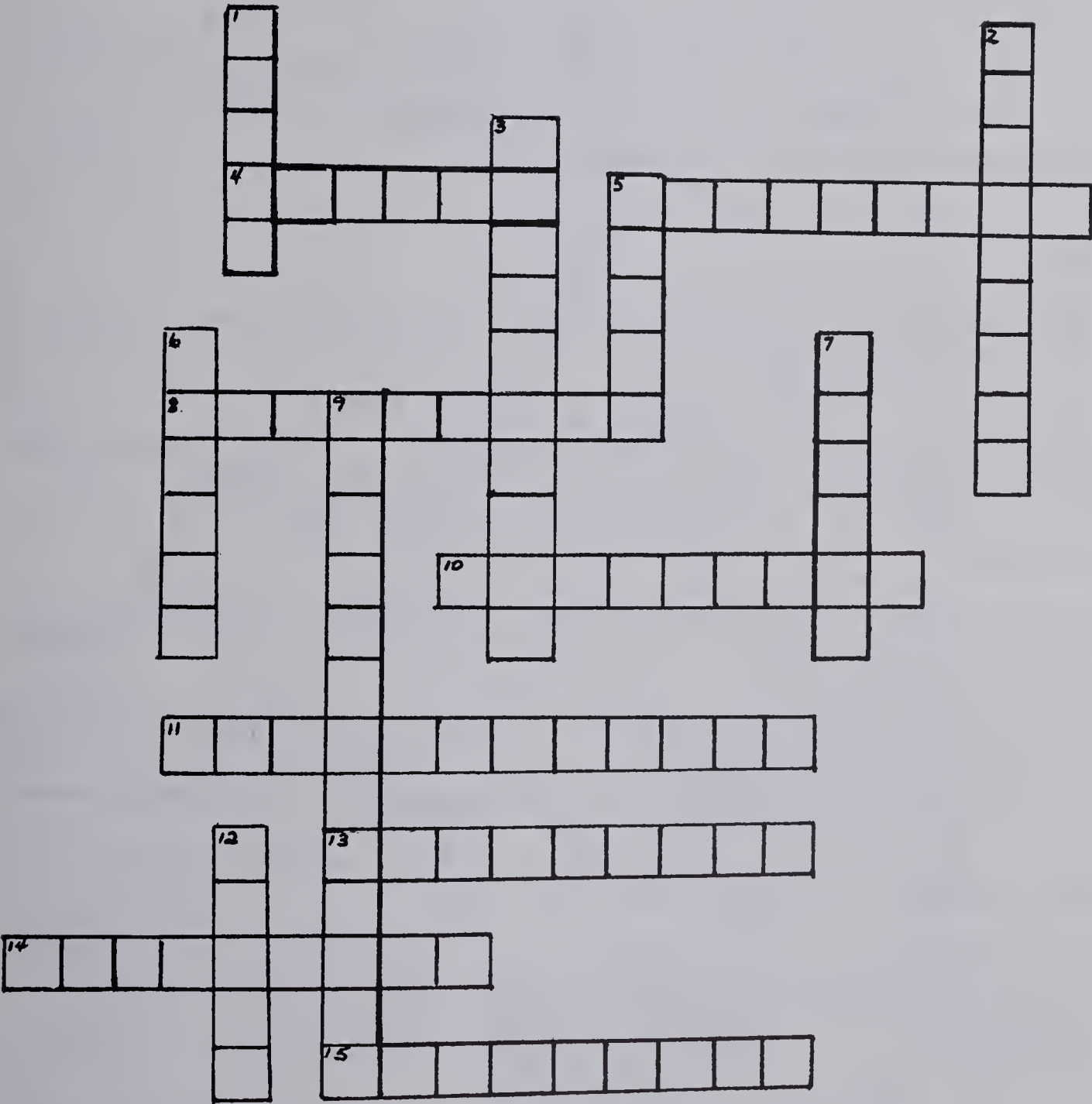
5. Study your map carefully and answer the following questions:

- (a) What direction is Lake Athabasca from Fort McMurray?
- (b) What direction is Calgary from Sylvan Lake?
- (c) What direction is Grande Prairie from Lesser Slave Lake?
- (d) What direction is Milk River from Peace River?
- (e) What direction is Jasper from Banff?
- (f) What direction is Medicine Hat from Grande Prairie?
- (g) What direction is Banff from Lake Athabasca?
- (h) What direction is Red Deer from Sylvan Lake?
- (i) What direction is Fort McMurray from Jasper?
- (j) What direction is Drumheller from Medicine Hat?

- (k) If you travelled from: Lethbridge to Medicine Hat what direction would you travel?
 - (l) If you travelled from Grande Prairie to Drumheller what direction would you travel?
 - (m) If you travelled from Peace River to Edmonton what direction would you travel?
 - (n) If you travelled from Calgary to Fort McMurray what direction would you travel?
 - (o) If you travelled from Jasper to Sylvan Lake what direction would you travel?
 - (p) If you travelled from Milk River to Grande Prairie what direction would you travel?
 - (q) If you travelled from Lake Claire to Banff what direction would you travel?
6. Look carefully to see where all of the cities and towns on your map are located in relation to the lakes and rivers surrounding them. Can you explain in two or three sentences why the cities and towns have been built where they are?

Crossword Puzzle

WATER



Student Master #12

CROSSWORD PUZZLE - WATER

Name _____

DOWN:

- 1 The largest river in Alberta
- 2 When waste material is continually thrown into water,
_____ may be the result
- 3 Farmers in southern Alberta are supplied with _____
water to help their crops grow.
- 5 The magic circle that water flows in is called the water
_____.
- 6 The waste material that is put into water is called
_____.
- 7 Garbage and sewage rob water of its life-giving _____.
- 9 In the water cycle, the water held by the clouds drops
as rain or snow. The water falling is known as _____.
- 12 It covers most of the world

ACROSS:

- 4 The sun turns water into _____ which rises in the
air and forms clouds.
- 5 Industrial sewage usually contains them.
- 8 The heat of the sun causes water to _____ from the
oceans, rivers, lakes, ponds, trees and plants.
- 10 In the water cycle, water vapour cools and _____ into
clouds.
- 11 Water should be treated in a _____ plant before
people drink it.
- 13 The largest lake in Alberta
- 14 The place where the majority of Alberta's rivers originate
- 15 The direction that river water usually flows in Alberta

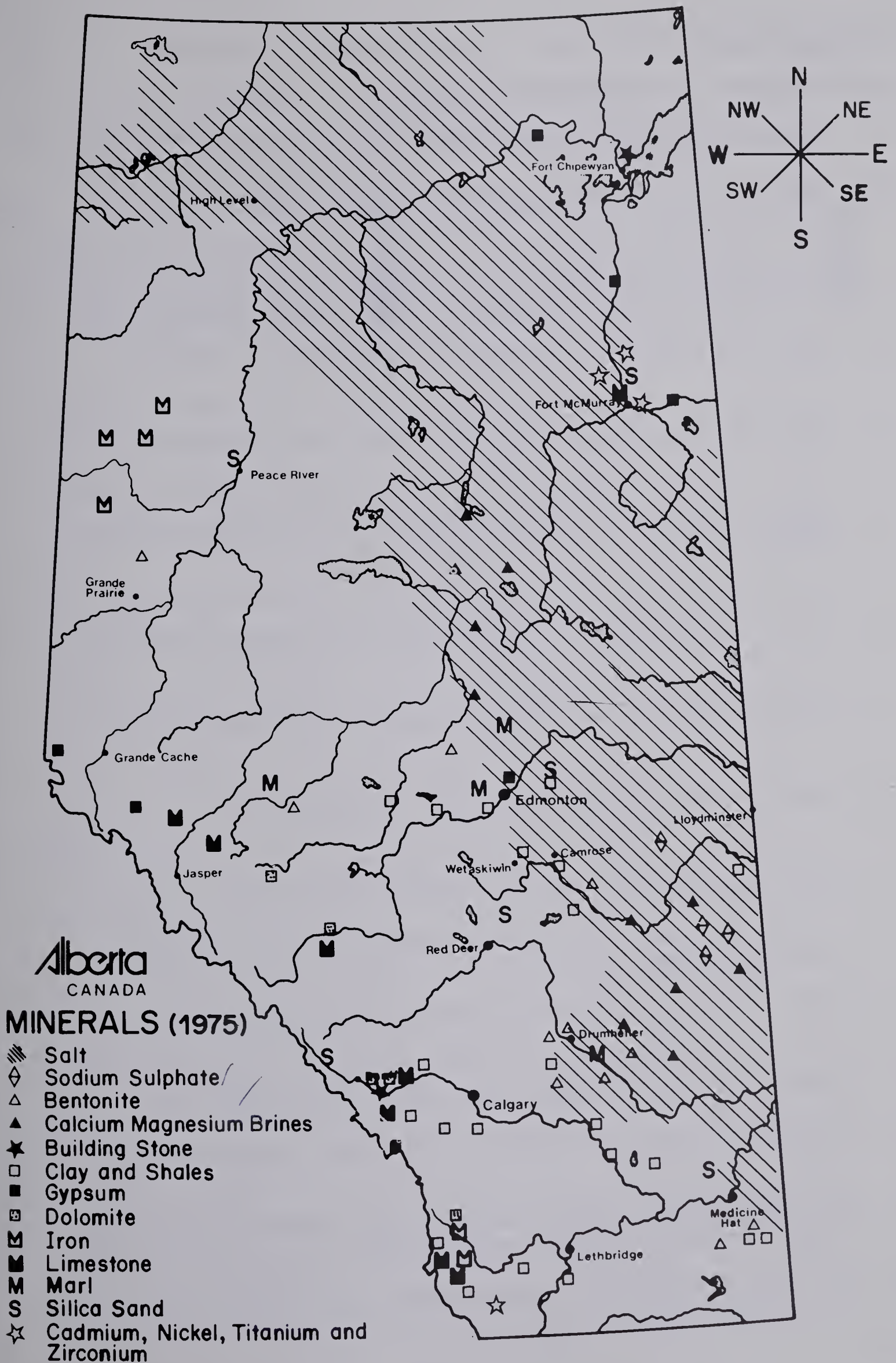
Choose words from the list below:

northeast
precipitation
sewage
pollution

condenses
Athabasca
purification
water

mountains
evaporate
irrigation
chemicals

cycle
Slave
oxygen
vapor









Student Master #14

MAP EXERCISE ON MINERALS OF ALBERTA

Name _____

1. Which year was this map made in? _____
2. What do the following symbols stand for?

 _____  _____  _____	 _____  _____  _____
---	--
3. Name the province located to the east of Alberta.

4. Name the province located to the west of Alberta.

5. Name 3 minerals located close to the capital city of Alberta.

6. Which minerals are located north of Grande Prairie?

7. Which minerals are located south of Medicine Hat?

8. Name 5 minerals located close to Drumheller.

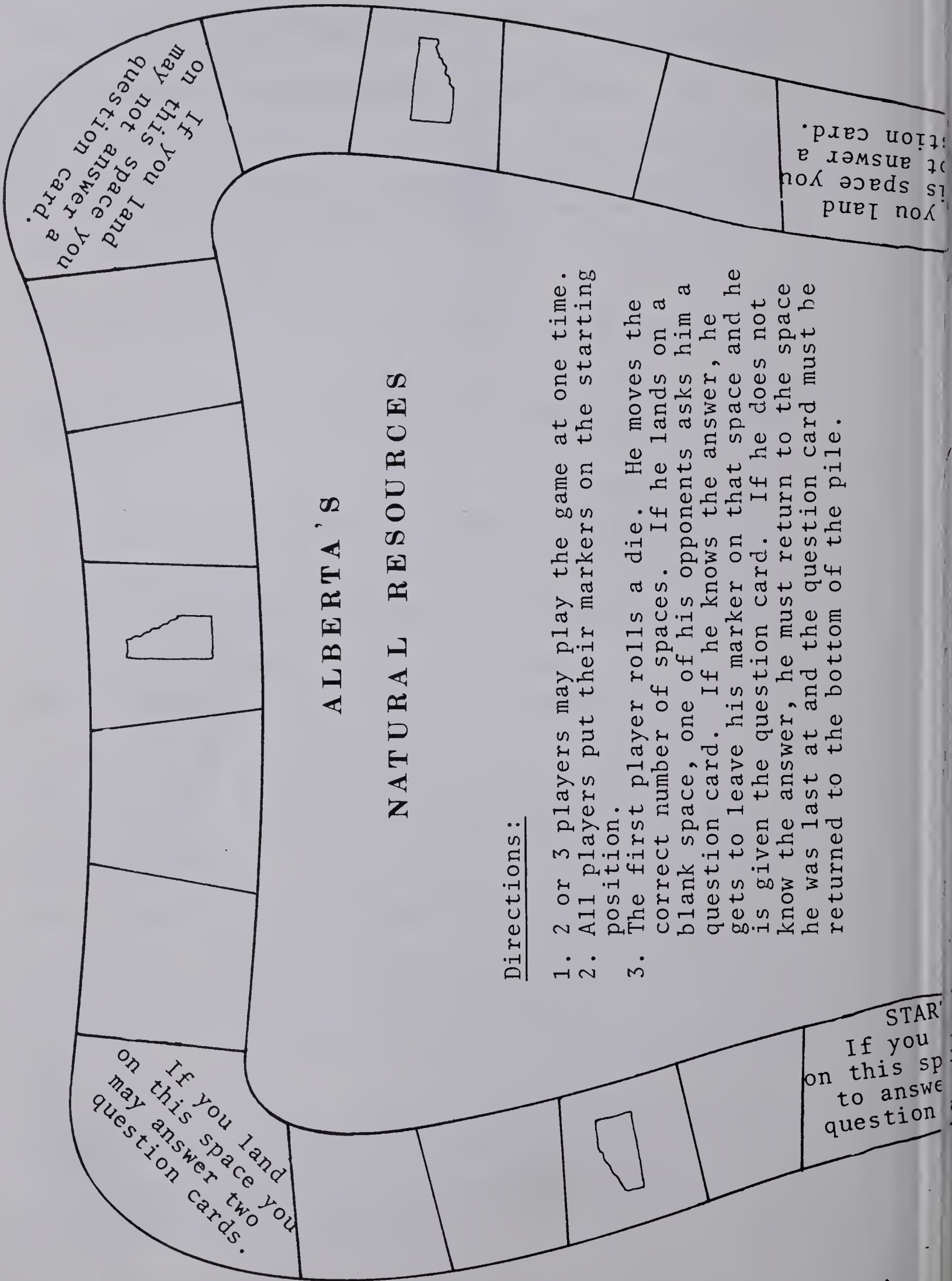
9. Which mineral is located around High Level? _____
10. Circle the mineral found furthest north in Alberta - iron or gypsum
11. Name 5 minerals located close to Fort McMurray.

12. Which mineral is found over most of Alberta? _____
13. Are there more limestone or more marl deposits on the map? _____
14. Are there more silica sand or more calcium magnesium brine deposits located on the map? _____
15. Is sodium sulphate located closer to Grande Prairie or to Lloydminster? _____

16. Is limestone located closer to Banff or to Lethbridge?

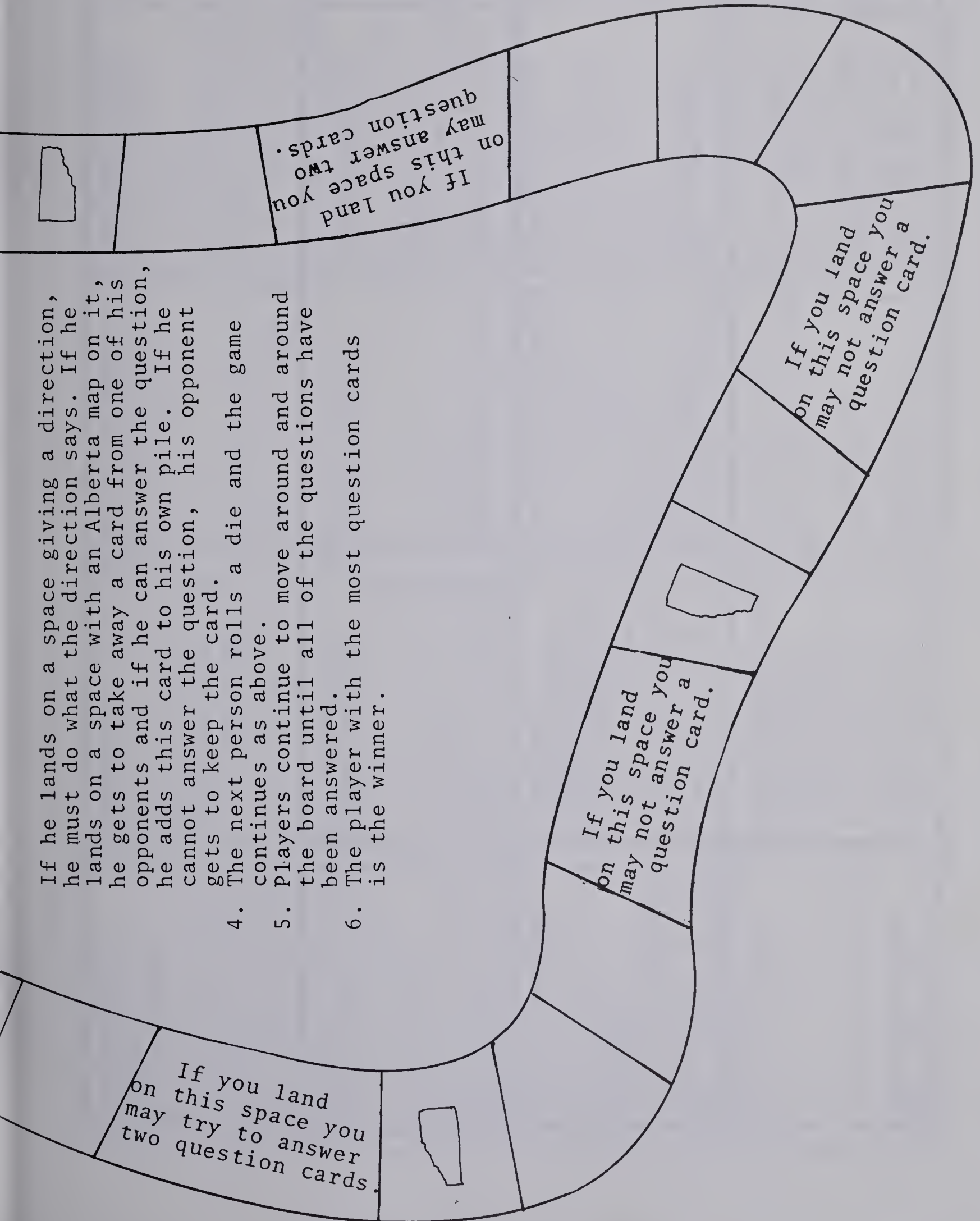
17. Are there more marl deposits near Edmonton or near
Drumheller? _____
18. Is iron located closer to Wetaskiwin or to Peace River?

19. Is dolomite located closer to the Rocky Mountains or to
the Alberta/Saskatchewan border? _____



If he lands on a space giving a direction, he must do what the direction says. If he lands on a space with an Alberta map on it, he gets to take away a card from one of his opponents and if he can answer the question, he adds this card to his own pile. If he cannot answer the question, his opponent gets to keep the card.

4. The next person rolls a die and the game continues as above.
5. Players continue to move around and around the board until all of the questions have been answered.
6. The player with the most question cards is the winner.



Who runs the National Parks? (Federal Government)	Sometimes farmers left a field cultivated and unplanted for several years. What was this called? (Summerfallowing)	Name the capital of Alberta. (Edmonton)	What do we call it when birds and animals die off and no longer exist? (Extinction)
The amount of rain, snow, hail or moisture deposited in an area is called? (Precipitation)	What do you call the heavy iron frame with sharp spikes attached which a farmer pulls across his plowed field? (Harrow)	Name the province to the west of Alberta. (British Columbia)	Name the green colouring in plants. (Chlorophyll)
What is the name of the fence used by cattlemen to fence their cattle? (Barbed Wire Fence)	What is an insect pest which bothers farmers? (Grasshoppers)	Name the province directly east of Alberta. (Saskatchewan)	What is the word which means "taking care of our natural resources"? (Conservation)
What was the name given to the many people who came to Canada from other countries to homestead and settle? (Immigrants)	What do you call the short stumps of grass left standing after the harvest? (Stubble)	What is the name of Alberta's premier? (Peter Lougheed)	The replanting of areas where forest fires and lumbering have removed trees is called? (Reforestation)

The name of the railway built across Canada is? (Canadian Pacific Railway)	Name the two most famous and important national parks in Alberta. (Banff and Jasper)	What is the name of the country directly south of Alberta? (United States)	What did Indians use for thread? (Sinew)
Name the method by which farmers in southern Alberta get enough water to grow their crops. (Irrigation)	Name the largest national park in Alberta. (Jasper)	Name the flower emblem of Alberta. (Wild Rose)	What was used by Indians to transport loads and was pulled by dogs or horses? (Travois)
"Breaking" is another word for which farming operation? (Plowing)	How many national parks are located in Alberta? (5)	What is the process whereby sunlight changes carbon dioxide into carbohydrates? (Photosynthesis)	Who did the Indians believe had created all things? (Great Spirit)
Name the largest lake in Alberta. (Lake Athabasca)	What is the best way to transport oil and gas? (Pipeline)	Which fossil fuel is made from decayed plant life? (Coal)	What is the name of a round boat made out of skins and used by the Indians? (Bull Boat)

The rivers of Alberta drain into 3 large bodies of water. Name one of these large bodies. (Arctic Ocean, Hudson Bay, Gulf of Mexico)	What is a bull boat? (A boat used by the early Indians of Alberta)	Which fossil fuel is made from decayed animal matter? (Oil or Gas)	What is a mineral? (Naturally-occurring substances obtained from the earth by mining -- used in most industrial processes.)
Name 1 type of fish found in Alberta's lakes and rivers. (Whitefish, Trout, Pike, Pickerel, Perch, Tullibee)	Where are the oil sands located? (Athabasca area or Fort McMurray area)	Name the mineral found in Alberta that plaster of paris is made from. (Gypsum)	Name the animal which was most important to the Indians. (Buffalo)
Where was the first oil discovered in Alberta? (Cameron Creek in Waterton National Park)	What is Syncrude? (A large company made up of oil companies and government that work together to mine and sell oil from the oil sands.)	What is a renewable resource? (Material in nature that can be replenished over a period of time)	What is the name given to the 160 acres of land the early settlers were given? (Homestead)
The famous Dingman Oil Well "blew in" in 1914. Where was it located? (Turner Valley)	Name 3 fossil fuels. (Oil, Natural Gas, Coal)	What is a non-renewable resource? (Material in nature that cannot be replenished once it has been used.)	What kind of house did the early settlers build? (Dugout or sod houses)

What famous oil field was discovered in 1947? (Leduc)	What does a "tool push" do? (Supervise the drilling of a well. He is the boss.)	What is a natural resource? Something that is provided by nature that has value and is of use to human beings.	Which soil is the best suited to farming? (Black Soil)
What is a dry hole? (A well where there is no gas, oil or water.)	Which river in Alberta has the most water flowing through it? (Slave River)	Name 1 method used to mine coal in Alberta. (Strip mining, underground mining, hydraulic mining)	What is the name given to the way the early settlers scattered their seeds on the field? (Broadcasting)

LAND

Student

Activity Cards

LAND:

ACTIVITY ONE: Reading to Find the Answer

A. Soils in Alberta

Instructions:

1. Read the excerpt "Soils in Alberta" (Land: excerpt #1).
 2. Answer the following questions in complete sentences in your scribbler.
 - (a) Which soil area is the best suited for farming?
 - (b) Which soil area is the poorest?
 - (c) Is rich, good soil enough to make crops grow? Why or why not?
 - (d) Is soil a renewable or non-renewable resource? Explain your answer. Discuss your answer with your teacher.
-

LAND:

ACTIVITY ONE: Reading to Find the Answer

B. The Indians

Instructions:

1. Read the excerpt "How Indians Used the Land" (Land: excerpt #2).
2. Answer the questions in complete sentences in your scribbler.
 - (a) Who were the first inhabitants in Alberta?
 - (b) Why did the Indians follow the buffalo?
 - (c) How did the horses make the task of the Indian hunter easier?
 - (d) What does it mean to "adapt to the environment?"

LAND:

ACTIVITY ONE: Reading to Find the Answer

C. Early Settlers (Cattlemen)

Instructions:

1. Read "The Cattlemen" (Land: excerpt #3).
 2. Answer the questions in complete sentences in your scribbler.
 - (a) List the reasons why unfenced grazing came to an end.
 - (b) Why is a barbed wire fence able to keep the cattle penned?
 - (c) What tools did the cattlemen use?
-

LAND:

ACTIVITY ONE: Reading to Find the Answer

D. Early Settlers Settle the West

Instructions:

1. Read "The Early Settlers Settle the West" (Land: excerpt #4).
2. Answer the questions in complete sentences in your scribbler.
 - (a) Why did the C.P.R. receive large pieces of land?
 - (b) What did the C.P.R. and the government decide to do with the land?
 - (c) Why did the government advertise for settlers?
 - (d) What is a homestead?
 - (e) How could a settler get a homestead?
 - (f) Do you think it was a good idea that many settlers came to live in Alberta? Why or why not?

LAND:

ACTIVITY ONE: Reading to Find the Answer

E. Starting to Farm

Instructions:

1. Read "Starting to Farm" (Land: excerpt #5).
 2. Answer the questions in complete sentences in your scribbler.
 - (a) How much money did the settler pay for his right to a piece of land?
 - (b) What was the total amount of money a settler needed to buy all the machines, animals and his right to a piece of land?
 - (c) Pretend you are a settler with only \$500 to spend. List what you would buy. (Remember you cannot spend more than \$500.)
-

LAND:

ACTIVITY ONE: Reading to Find the Answer

F. How the Early Settlers Used the Land

Instructions:

1. Read "How the Early Settler Used the Land" (Land: excerpt #6).
2. Answer the questions in complete sentences in your scribbler.
 - (a) What kind of plow did the early settlers use?
 - (b) How did the early settler seed his land?
 - (c) What is a drill?
 - (d) Why did the settler pull a pile of brush over the seeds?
 - (e) How do you think the early settler would feel at the end of a day after plowing and seeding his land?

LAND:

ACTIVITY ONE: Reading to Find the Answer

G. Harvesting the Crop

Instructions:

1. Read "Harvesting the Crop" (Land: excerpt #7).
 2. Answer the questions in complete sentences in your scribbler.
 - (a) How was the grain cut?
 - (b) What is a binder?
 - (c) What does a threshing machine do?
 - (d) List four different jobs that men had to do in the harvesting of grain.
 - (e) Why do you think that being the engineer was the most important job?
-

LAND:

ACTIVITY ONE: Reading to Find the Answer

H. The Threshing Crew

Instructions:

1. Read "The Threshing Crew" (Land: excerpt #8).
2. Answer the questions in complete sentences in your scribbler.
 - (a) What is a "threshing" crew?
 - (b) Why were so many men needed to help harvest the grain?
 - (c) Where did the men sleep?
 - (d) Do you think working on a threshing crew was a good way to earn a living? Why or why not?

LAND:

ACTIVITY ONE: Reading to Find the Answer

I. Problems of the Early Settlers

Instructions:

1. Read the excerpt "Problems of the Early Settlers" (Land: excerpt #9).
2. Answer the questions in complete sentences in your scribbler.
 - (a) Explain why the pioneers needed a new kind of plow?
 - (b) What is summerfallow?
 - (c) What is harrowing?
 - (d) What tools and machines did the early farmer use?
 - (e) How did the tools and machines used by the early farmer affect the land?
 - (f) How was the climate a problem to the early settler?
 - (g) What plant diseases attacked the crops?

LAND:

ACTIVITY ONE: Reading to Find the Answer

J. Homes of the Early Settlers

Instructions:

1. Read the excerpt entitled "Homes of the Early Settlers" (Land: excerpt #10).
2. Answer the questions in your scribbler.
 - (a) What is a dugout?
 - (b) What is a sod house?
 - (c) How were the sod blocks made?
 - (d) Why didn't the early settlers build wooden houses?
 - (e) Why did the roof of the sod house sometimes turn green?
 - (f) Would you like to live in a sod house? Why or why not?
 - (g) What tools or machines did the early settler use to build his home?
3. (a) Try building a model of a sod house using any material you can find (toothpicks, dry grass, straw, cardboard).

-OR-

- (b) Make a sketch of a sod house.

LAND:

ACTIVITY ONE: Reading to Find the Answer

K. The Farmer Today

Instructions:

1. Read the excerpt "The Farmer Today" (Land: excerpt #11).
 2. Answer the questions in your scribbler.
 - (a) Explain new ways of farming which have helped the farmer prevent soil erosion.
 - (b) Why have farms become larger since the early settlers came?

(Clue: Think about the changes in tools and machinery)
-

LAND:

ACTIVITY ONE: Reading to Find the Answer

L. Mountain Scenery as a Natural Resource

Instructions:

1. Read "Mountain Scenery as a Natural Resource" (Land: excerpt #12).
2. Answer the questions in complete sentences in your scribbler.
 - (a) Which are the two most famous National Parks?
 - (b) What attracted the first man to the Banff area?
 - (c) Why was Jasper important in the early days?
 - (d) How was Waterton used in the early days of the ranchers?
 - (e) How are plants and animals treated in a national park?
 - (f) Tell why mountain scenery is considered to be a natural resource? Explain in your own words.

LAND:

ACTIVITY ONE: Reading to Find the Answer

M. Tourism

Instructions:

1. Read "Tourism" (Land: excerpt #13).
 2. Answer the questions in complete sentences in your scribbler.
 - (a) How many national and provincial parks does Alberta have?
 - (b) What do tourists need when they visit the national and provincial parks?
 - (c) Why does Alberta need a good highway system?
 - (d) Why is the tourist industry important to Albertans?
 - (e) Should Albertans increase their use of this natural resource (mountain scenery)? Why or why not?
-

LAND:

ACTIVITY TWO: Reading a Picture

A. Hunting Buffalo

Instructions:

1. Turn to page 26 and 27 in Alberta: A People and a Province:
2. Answer the questions in complete sentences in your scribbler.
 - (a) List what you see in the picture.
 - (b) How were the buffalo killed?
 - (c) What tools (technology) did the Indian use to kill the buffalo?

LAND:

ACTIVITY TWO: Reading a Picture

B. Homes of the Early Settlers

Instructions:

1. Turn to page 35 in Alberta: A People and a Province and answer the questions in your scribbler.
 2. Study the picture in the top half of the page.
 - (a) Make a list of things about the house you see in the picture.
 - (b) What are some of the advantages of living in this kind of house?
 - (c) What are some of the disadvantages of living in this kind of house?
-

LAND:

ACTIVITY TWO: Reading A Picture

C. The Sod House

Instructions:

1. Turn to page 34 in Alberta: A People and a Province.
2. "READ" the picture on page 34 and answer the questions in your scribbler.
 - (a) Make a list of things about the house you see in the picture.
 - (b) What are the advantages of this house?
What are the disadvantages?
 - (c) Why do you think early settlers built sod houses?

LAND:

ACTIVITY TWO: Reading a Picture

D. The National Parks

Instructions:

1. Turn to page 17 and 18 in Alberta: A People and a Province.
 2. Answer the following questions in your scribbler.
 - (a) Who runs the national parks?
 - (b) Why did the government make national parks?
 - (c) What do people do in national parks?
 - (d) Why are national parks important to Albertans?
-

LAND:

ACTIVITY THREE: Reading a Map

A. Indian Tribes in Alberta

Instructions:

1. Turn to page 25 in Alberta: A People and a Province and study the map showing the location of Indian Tribes.
2. Answer the following questions in your scribbler.
 - (a) List the names of the tribes located in Alberta.
 - (b) Which tribe lives closest to you?
 - (c) What does the map tell you about the territory of the early Indians?

LAND:

ACTIVITY THREE: Reading a Map

B. Soils in Alberta

Instructions:

1. Find a map of Alberta which indicates the soil areas in the province. (A map is found on page 34 in the Atlas of Alberta.)

2. Answer these questions in your scribbler.

(a) In which soil zone is each of the following located:

- | | |
|---------------------|-------|
| (i) Calgary | _____ |
| (ii) Medicine Hat | _____ |
| (iii) Edmonton | _____ |
| (iv) Grande Prairie | _____ |
| (v) Red Deer | _____ |
| (vi) Lethbridge | _____ |
| (vii) Lloydminster | _____ |
| (viii) Your home | _____ |

(b) Explain why most of the cities of Alberta (Calgary and Edmonton) are located in the Black Soil area.

(c) If you were an early settler and wanted to farm, where would you try to homestead? Why?

(d) Early settlers did not have soil maps. Sometimes they did not know whether the soil on their homestead was good or bad. What kind of problems might they encounter?

LAND:

ACTIVITY THREE: Reading a Map

C. National Parks in Alberta

Instructions:

1. Turn to page 16 in Alberta: A People and a Province.
 2. Answer the following questions in your scribbler.
 - (a) What do you notice about the sizes of provincial and national parks?
 - (b) List the names of the national parks?
 - (c) Which national parks have you visited?
 - (d) Is the government justified in setting aside land as a national park? Why or why not?
-

LAND:

ACTIVITY FOUR: Creative Activities

A. Making an Advertisement

Instructions:

1. Think about what Alberta offers to new immigrants.
2. Pretend you are a government official and wish to advertise Alberta to immigrants. Design a poster which shows that Alberta is a good place for immigrants to live.

LAND:

ACTIVITY FOUR: Creative Activities

B. Write a Letter

Instructions:

1. Think about what you have learned about the early settler in Alberta.
 2. Pretend you are an early settler in Alberta. Write a letter to a friend explaining your activities as you file a homestead claim, buy a grub stake, build your sod house, and begin to plant crops.
-

LAND:

ACTIVITY FIVE: Conducting Interviews

A. The Depression

Instructions:

1. Interview your grandmother, grandfather or an elderly person you know.
2. Ask them some of the following questions and take notes of their answers. YOU MAY WISH TO USE A CASSETTE RECORDER.
 - (a) What was the depression?
 - (b) Why did it happen?
 - (c) What hardships did you endure?
 - (d) What is the most interesting event you remember about the depression years?
 - (e) Would you like to live through another depression? Why or why not?

OR

3. Ask for old family photographs taken during the depression. Mount them and write a short paragraph about what you found out.

LAND:

ACTIVITY FIVE: Conducting Interviews

B. The Modern Farmer

Instructions:

1. Interview a farmer to find out about today's farming.
 2. Ask the questions and record your answers.
 3. Present your findings to your group.
 - (a) How much land do you cultivate?
 - (b) What do you grow?
 - (c) What machinery do you use?
 - (d) What are your major expenses?
 - (e) How do you take care of the land?
 - (f) Do you use insecticides? pesticides?
Why or why not?
-

LAND:

ACTIVITY SIX: Reading a Graph

A. Farm Machinery in Alberta

Instructions:

1. Turn to page 68 in Alberta: A People and a Province.
2. Answer the questions in your scribbler.
 - (a) Which machines have Alberta farmers stopped using?
 - (b) Why are these machines no longer used?
 - (c) What are some new machines on the farm?
 - (d) Which machines have been used for many years and are used even more today?

LAND:

ACTIVITY SIX: Reading a Graph

B. Mean Precipitation (10-year running)

Instructions

NOTE: Precipitation means the amount of rain, snow, hail, or moisture deposited in a certain area. The graph shows the mean (average) amount of precipitation at 5-year intervals in parts of Alberta since 1895.

1. Study the graph (Alberta Atlas - page 18 and Excerpt 14).

2. Fill in the blanks. Find the answers on the graph and write them in your scribbler.

(a) Which place is the driest? _____

(b) Which place is "usually" the wettest? _____

(c) Which years were the wettest years in:

Calgary _____

Banff _____

Edmonton _____

Medicine Hat _____

(d) Which years were the driest years in:

Calgary _____

Banff _____

Edmonton _____

Medicine Hat _____

(e) When was there a cluster of wet years at all four places? 19____ to 19____.

(f) When was there a cluster of dry years at all four places? 19____ to 19____.

3. Pretend you are an early settler coming to homestead in Alberta.
- (a) Would you decide to start farming in 1905? Why? Why not?
-
- (b) Would you decide to start farming in 1935-1940? Why? Why not?
-
4. A short grass called Buffalo Grass grows in Alberta. Why do you think only short grasses grow in Alberta?
-

LAND:

ACTIVITY SEVEN: Using the Encyclopædia

A. Crop Diseases

Instrucitons:

1. Use the World Book or any other encyclopædia.
2. Look up information on smut and rust.
3. Tell in a paragraph what each disease is and how it is controlled.

LAND:

ACTIVITY SEVEN: Using the Encyclopædia

B. Crop Plagues (Grasshoppers)

Instructions:

1. Look up information about grasshoppers in the encyclopædia.
 2. Answer the following questions in your scribbler.
 - (a) What do grasshoppers eat?
 - (b) Why are grasshoppers a pest to farmers?
 - (c) Pretend you are an early settler. How would you feel if you found a large number of grasshoppers in your fields?
 3. Draw a picture of a grasshopper.
-

LAND:

ACTIVITY EIGHT: Using the Dictionary

A. Indian Tribes and Languages

Instructions:

1. Use the dictionary to look up the following names of Indian tribes:

Cree, Beaver, Chipewyan, Slave, Plain, Wood Cree, Blackfoot, Blood, Piegan, Sarcee, Stoney.
2. Write one fact about each tribe.

LAND:

ACTIVITY EIGHT: Using the Dictionary

B. Brands and Branding

Instructions:

1. Use your dictionary to look up the meaning of the words: brand, branding.
2. Write a sentence using each word.
3. Find the meanings of these words and write a short paragraph in your scribbler:

furrow, plough, share, yoke, sod.

LAND:

ACTIVITY NINE: Using a Table of Contents or Index

A. How the Indians Used the Land

Instructions:

1. In your library or at your stations find two books written about Indians.
2. Use the table of contents and/or index to locate information about how the Indians hunt buffalo.
3. Write a paragraph or draw a picture which tells about this topic.

LAND:

ACTIVITY NINE: Using a Table of Contents or Index

B. The Cattlemen

Instructions:

1. Find a book in your school library which tells about cattle brands.
2. Use the table of contents and/or index to locate information about cattle brands used in southern Alberta.
3. Draw and name five famous Alberta brands.
4. Design your own brand.

LAND:

ACTIVITY NINE: Using a Table of Contents or Index

C. Threshing by Early Settlers

Instructions:

1. Look up information about threshing in reference books and encyclopædias.
2. Complete the following activities in your scribbler.
 - (a) Before the large harvesting machines were invented, the farmers had to harvest their grain crops by hand. Some of the hand implements they used were sickles, scythes and hoes.

Draw a picture of each and give a short explanation of their use.

Make sure you can pronounce these three words.

- (b) After the harvesters had cut the grain, they tied it into bundles called sheaves. Using long, wooden three-pronged forks, they then stooked, or stood, the sheaves in the field to dry.

Draw a picture of sheaves of wheat stooked in a field to dry.

- (c) Tell in a complete sentence what each of the following machines did:
 - (i) reapers
 - (ii) binders
 - (d) Why were the prairie farmers so glad to have these new machines to help them do the harvesting?
 - (e) Give two sources of power for the harvesting machines.

LAND

Excerpts

SOILS IN ALBERTA

In Alberta a number of different soils are found. Each soil type is a different colour and has different uses.

BROWN SOILS - are found in the semi-arid short grass section of the province in the Medicine Hat area. The soil is brown in colour. The average (mean) annual precipitation is about 30.48 cm (12 inches). Because moisture is so limited only part of the area is being farmed. Most of the land is used as pasture. The area being farmed is cultivated under dry land agriculture with summerfallow. Some of the land is irrigated. The EID (Eastern Irrigation District) is regulated by the water dammed in the Bow River by the Bassano Dam. This irrigation project is one of the oldest in Alberta and allows farmers to grow crops in the area having the longest growing season in the province.

DARK BROWN SOILS - are found in an area a little less dry than the brown soils. Precipitation averages about 33.56 cm (14 inches) a year. The lack of moisture is the main problem the farmers have in this area. Farmers grow wheat and use summerfallow farming methods to assist them in the conservation of moisture.

BLACK SOILS - are the richest and most productive soils found in Alberta. Precipitation averages from 38.1 to 45.7 cm (15 to 18 inches) per year. Most of the Black Soil area is cultivated. A wide range of crops can be grown in the Black Soil area. Calgary, Red Deer, Edmonton and Lloydminster are located in the Black Soils area.

DARK GREY SOILS - occur next to the Black Soils and where there is tree cover. The average annual precipitation varies from 40.6 to 48.3 cm (16 to 19 inches). The frost free period is shorter than the Black Soil areas. A wide range of crops can be grown and their productivity is fairly high. The cities of Grande Prairie and Peace River are located in the Dark Grey Soil area.

GREY WOODED SOILS - occur in areas where many trees grow. Precipitation varies from 35.5 to 55.8 cm (14 to 22 inches) from the north to south in the province. These soils are low on fertility so farmers add fertilizers to the land. Coarse grains (barley, oats) and hay are the main crops grown. Careful soil management by the farmers is needed to grow good crops.

BROWN WOODED SOILS - also occur where the forests grow along the mountains. The soil is not very fertile. Very few acres are cultivated.

Land: Excerpt #1

HOW THE INDIANS USED THE LAND

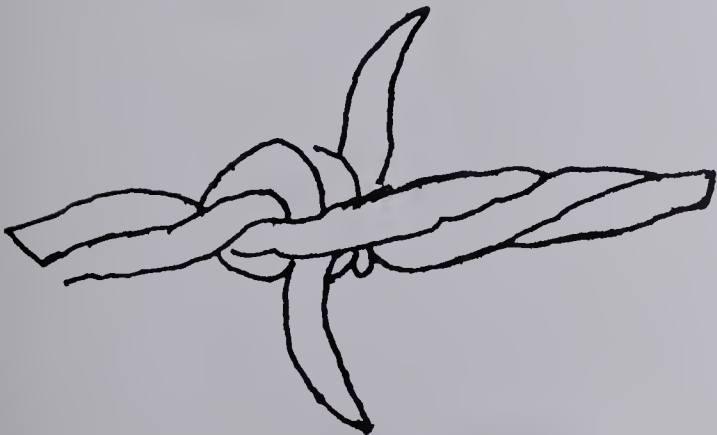
When the first white men came to Alberta, the only inhabitants were Indians who were hunters. They lived by hunting the buffalo which roamed across the plains in large herds. Each winter the buffalo moved south or west in search of food. Each spring when the snow melted and the grass became green the buffalo moved north again. The Indians knew about these migrations and moved their homes to follow the buffalo. They used the buffalo for many of their daily needs - food, shelter, and clothing.

At first the Indians hunted the buffalo on foot. But far away to the south in Mexico, the white men (Spanish settlers) brought horses with them from Europe. There had never been horses in North America before they came. Some of the horses escaped to the prairies and became herds of wild horses. The Indians learned to capture and ride them which made their tasks as hunters easier. In this way the Indians became very well adapted to their environment.

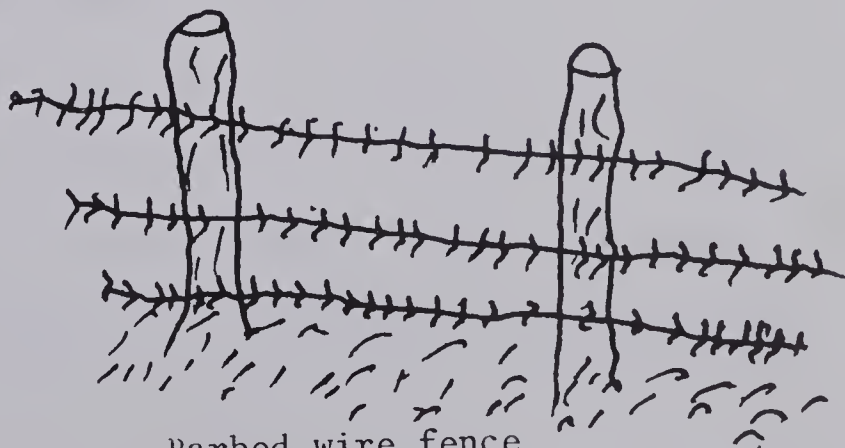
THE CATTLEMEN

Many white men came to live on the land which today is called Alberta. First the fur traders and explorers came. Then came the cattleman and cowboy who ran huge herds of cattle wild over unfenced country. The rancher could tell his own beasts by brand marks burned into their hides. Water was drawn from rivers, lakes and wells and the cattle spent long, cold winters on the range. Several winters' bad blizzards killed most of the cattle. Ranchers then realized they had to keep their cattle in a safe place and feed them throughout the cold weather.

Meanwhile the pioneer farmer also came to Alberta. The ranchers and cattlemen had to fence in their cattle. The ranchers moved to southern Alberta near to the Rockies as more farmers came to settle. At about this time barbed wire was invented and it made it possible for the rancher to keep his cattle out of the farmer's fields. The rancher built a barbed wire fence around his grazing land.



Barbed wire



Barbed wire fence

Several strands of barbed wire were tightly strung between fence posts set around the property. A barb is a sharp point and a strand of wire with sharp points all along it is called barbed wire.

Land: Excerpt #3

THE EARLY SETTLER SETTLES THE WEST

The Canadian Pacific Railway had been built across Canada. The railway cost the company and the country a great deal of money. For building the railway the C.P.R. Company received large pieces of land which could be sold to the early settler. The government also wanted people to come west and settle in Alberta.

Under Prime Minister Sir Wilfred Laurier, the government of Canada advertised for immigrant settlers in Britain, Europe and the United States. Immigration Minister Clifford Sifton thought the best settlers for Western Canada were hardy farmers who would not mind the hard work needed to settle the land. A variety of posters and pamphlets with titles like Wondrous West, The Last Best West and The Land of Opportunity were printed by the government in many different languages.

Any man over eighteen years of age and any woman who was head of a family was allowed to take out a homestead. A homestead was usually one hundred and sixty acres or about 65 hectares of land. Each settler paid the government ten dollars for the right to homestead. Then the settler had to promise to do certain things. He had to build a house and live on his homestead for at least half of each year. Each year he had to plow or break a few acres of land and plant a crop. If he did these things, the homestead would become his in three years.

STARTING TO FARM

When the early settler had paid his ten dollars for the right to a piece of land, he had to buy some tools, machinery and a supply of groceries (called a grub stake). The following list includes what a settler needed to start farming:

1 team of horses	\$250.00
1 set of harness	32.00
1 wagon	75.00
1 sleigh	25.00
1 plow	28.00
1 set harrows	20.00
1 disc harrow	25.00
1 seeder	85.00
1 roller	10.00
1 mower and rake	95.00
1 reaper and binder	155.00
Other smaller tools	50.00
Total:	<hr/> \$850.00

The homesteader should also have as many of the following as he can afford. He might start with:

4 cows at \$40.00 each	\$160.00
4 pigs at \$15.00 each	60.00
4 sheep at \$5.00 each	20.00
Poultry	10.00

Total:	<hr/> \$250.00
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HOW THE EARLY SETTLERS USED THE LAND

Soon after the cattleman had begun to raise cattle on the plains and hills of Alberta, the farmer also came to settle on the open spaces. Farmers were poor and often did not have the tools or machines to plow, sow and harvest the crops. Many times the work was done by hand.

Plowing the Land

The first settlers used a wooden plow which was pulled by a horse or cow. The farmer walked behind the plow to guide the horse and hold the sharp end of the plow in the soil. Later a plow with a sharp steel tip (share) was invented.

Seeding the Land

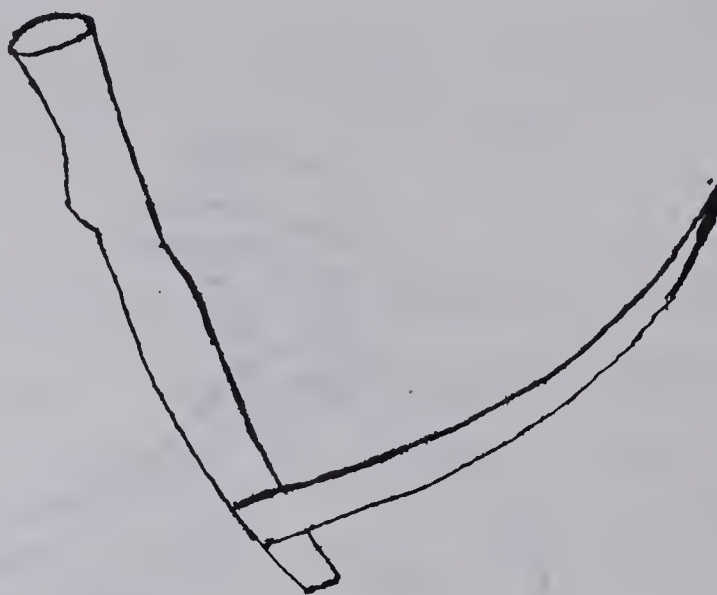
At first the farmer seeded the land by hand. He would carry a bag or sack of seeds on his shoulder and scatter a handful of seeds as he walked up and down the field. This was called broadcasting. Sometimes a farmer had a horse to ride back and forth across the field as he scattered the seeds. Then he would take a big bunch of bush or brush to rake over the seeds so that they would be covered with soil. Later a machine called drill or sower was invented to help the farmer plant his crops. The drill was pulled by horses or tractors across the field. As it moved, seeds dropped from a seed box down narrow tubes into the soil.



Land: Excerpt #6

HARVESTING THE CROP

When the crops were ripe, the crops were cut by hand with a large knife called a scythe. The grain was gathered in bundles and tied with a string. Later a machine



called a binder was invented. This machine cut the grain, tied the grain into bundles and dumped these bundles in large bunches all over the field.

In those days threshing was done with horses or steam-powered threshing machines. A threshing machine shakes the kernels of grain from the stalk and blows the stalk or straw out the back into a huge strawstack. The kernels of grain fell into a bin or were packed in gunny sacks.

Many men had to help the farmer thresh his grain; sometimes a crew of 20 men came to live with a farmer and his family during threshing time. There were men to carry the sacks of grain from the threshing machines to the

storage bins; others were on the straw stack poking the straw in place. Still others carried the bundles of grain from the field to the threshing machine; here, some men cut the strings and others fed the bundles into the machine. The engineer was the most important man because he kept the machine working and repaired.

Land: Excerpt #7

THE THRESHING CREW

The group of 20 or more men had to be fed and given a place to sleep. When preparing for the coming of the threshers, the farmer usually butchered chickens, a calf or hog to have enough meat to feed the hungry men. The farmer's wife baked bread, pies and prepared canned preserves.

The men slept in all sorts of places - straw stacks, hay piles, barns, on top of wagons, in shacks or granaries, or even outside on the ground. Usually a threshing crew brought a sleeping caboose with them in the event that the weather should become wet and cold.

Many times after the farmer had paid the threshing crew, paid the threshing bills and all other expenses, he had very little money left to pay for food, clothing and other supplies he needed for his family.

PROBLEMS OF EARLY SETTLERS

The early settler had many problems.

1. The Problem of Precipitation

One of the problems the early settler faced was that of weather and rainfall. Different kinds of grass grow in different parts of Canada because of the amount of rainfall an area receives. In Eastern Canada tall grasses grow because there was usually enough rainfall to keep the roots of the plants moist. As the farmers came farther and farther west, they came to areas where shorter grasses grew.

(a) Why do you think the grass was shorter in Alberta?

(b) If the grass was shorter, what would happen to the farmer's crops?

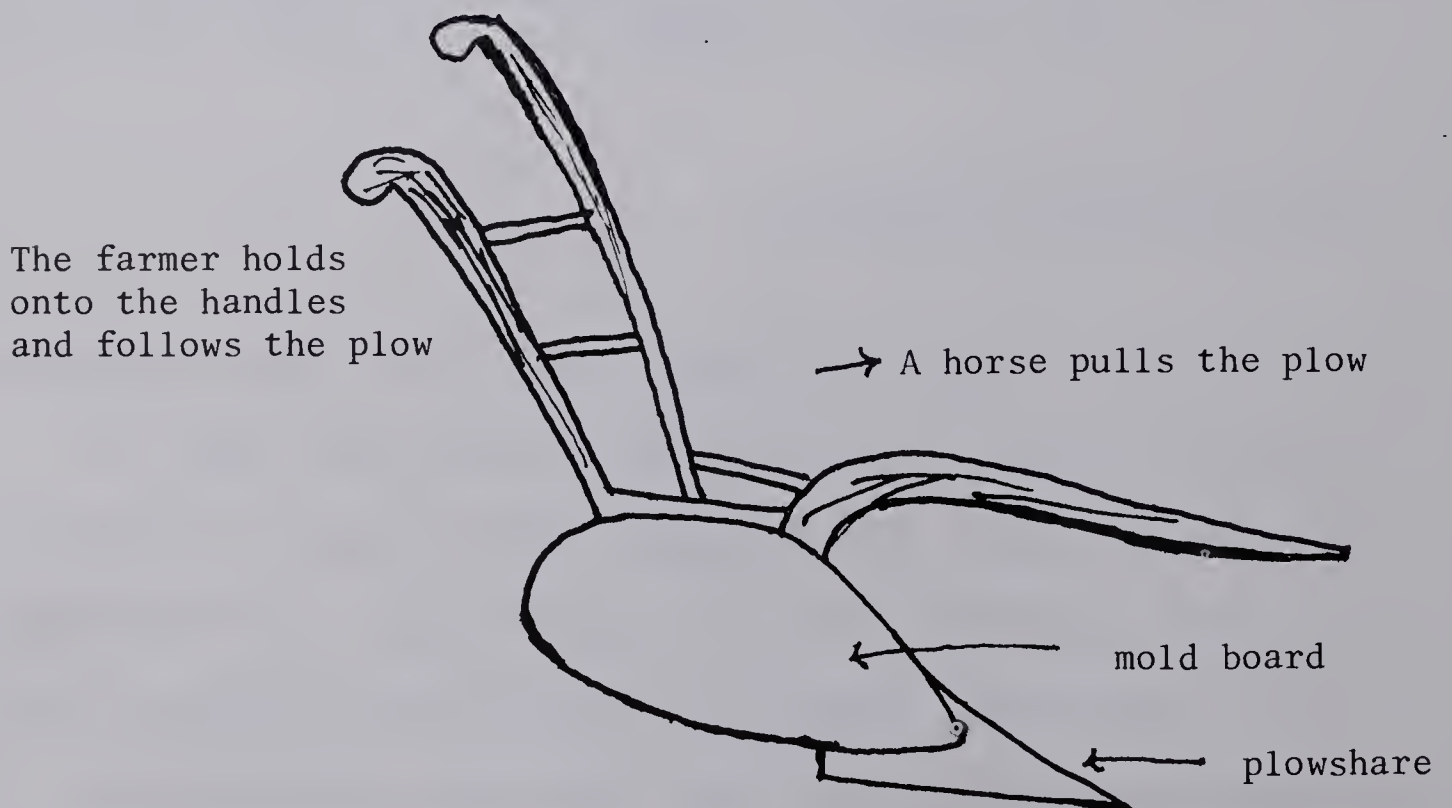
2. The Problem of Climate

The early settler also had trouble with the changeable climate. Sometimes a number of wet years came in clusters. When this happened, the pioneers believed the climate was wetter than it really was. So they applied for a homestead, bought machinery and started to farm. Sometimes they raised good crops for several years. But often the wet years were followed by a number of dry

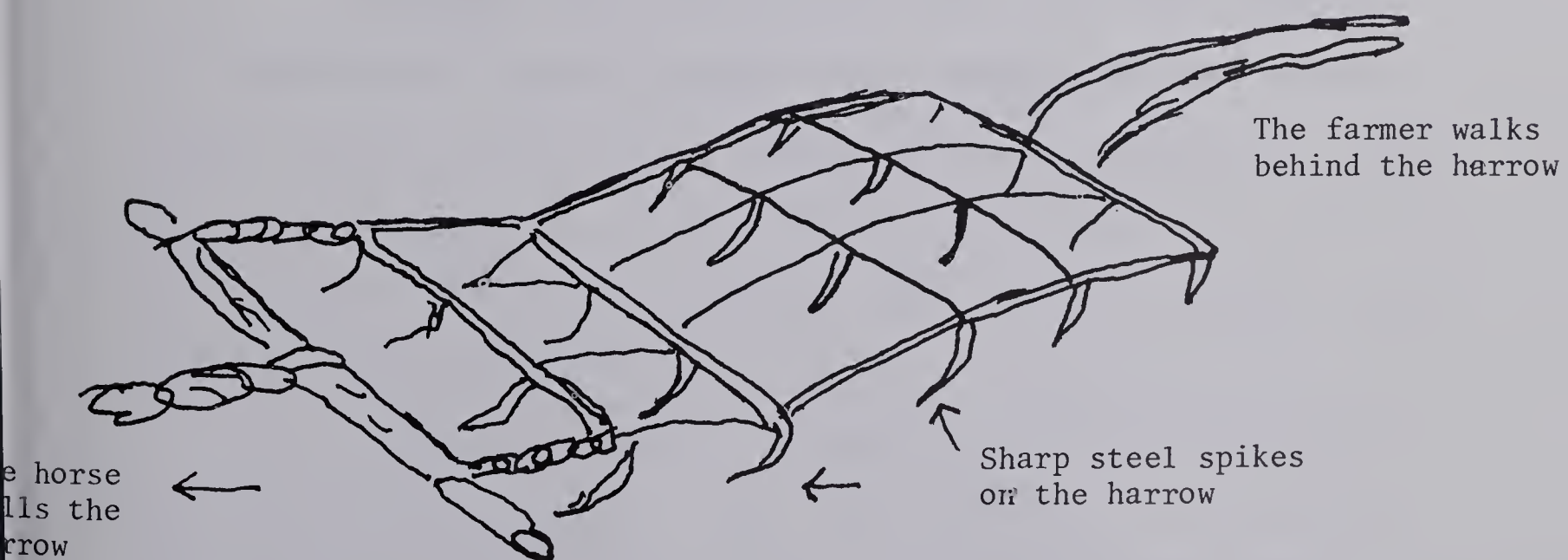
years. The dry years sometimes lasted for several years in a row. The pioneer farmer could not raise crops and many early farmers moved away.

3. The Problem of Erosion

Life in Alberta was a new experience for the pioneers. They did not understand about the dry and wet years. They did not understand that Alberta was always to be a drier climate. The early settlers made mistakes. One example of a mistake was the way farmers plowed the land. The first settlers used wooden plows. Later, a plow with a steel share was invented. Study the picture of the plow.



This plow had a large moldboard which turned the prairie soil over and exposed it to the sun and wind. The soil dried very quickly and crop yields fell when the land was cultivated year after year. Farmers also began a practice of farming referred to as summerfallowing. It was discovered that if a field was left cultivated and unplanted for a year, moisture would be stored in the upper layers of the soil. To prevent the moisture from escaping, the surface was harrowed until a layer of fine, dry soil was formed on top. A harrow is a heavy iron frame with sharp spikes attached and is pulled across the plowed land to level and smooth the surface.



The pioneer farmers made a second mistake. The continual harrowing during summerfallowing ground the lumps of dirt into fine, dry powder.

- (a) What do you think happened when the strong winds blew?
- (b) What would happen to the farmer's crops when the soil blew away?

4. The Problem of Pests and Plagues

To make things worse, plant diseases attacked the crops as well. Two of these diseases were smut and rust.

Do you know what these diseases are?

While all this was happening, plagues of grasshoppers attacked those crops which did manage to grow. Many farmers could not sell enough grain to pay for their farming expenses and had to leave their farms.

HOMES OF THE EARLY SETTLERS

All settlers who came to Alberta had to build some kind of house. This was difficult because parts of Alberta have very few trees. Pioneers had to travel long distances to find trees along rivers and near the mountains. The early pioneers adapted to their environment and used natural resources around them to build their homes.

A. Dugout Homes

Some early settlers lived in a house cut into a hill or into a river bank. A cave-like room was dug into a hillside and a door added to the opening. Rugs and blankets were hung around the walls to keep the dirt from falling in. The floors were covered with mats. The dugouts were cool in summer and warm in winter.

B. Sod Homes

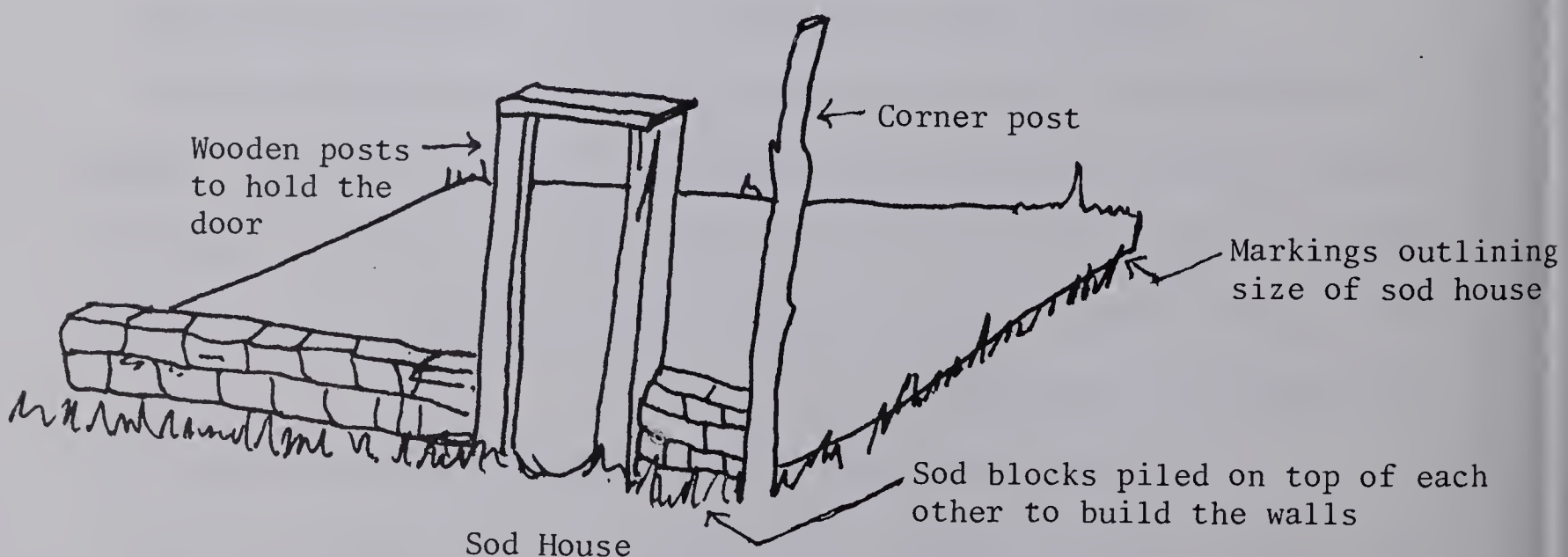
Another type of house used by early pioneers was the sod house. The sod houses were usually of one or two rooms, known to be cool in summer and warm in winter. These houses were cheap to build because the construction material was right there. Early settlers used blocks of prairie soil to build the sod house.

A horse-drawn one-shared walking plow was used to cut up the prairie soil. Then the turf was cut into foot-long pieces with a spade or axe. The blocks were then carried to the location where the house was to be built.

The outside walls of the sod house were marked on the ground and the sod blocks piled layer upon layer around the four walls. Spaces were left for windows and a door.

Sod blocks were laid to a height of seven feet. Then poplar poles were laid across the top quite close together to build the roof. The poplar poles on the roof were covered with two layers of sod blocks and dirt, keeping out the wind and snows but not always the rains. Often the roof would turn green in the summertime! Can you think why?

The inside walls of the sod house were coated with layers of clay mud and smoothed evenly. Then the walls were whitewashed. Whitewash is a mixture of lime, whiting and water and was used to make the walls clean and white. The floor was made from a mixture of clay, straw and water. This mixture was patted down smoothly and allowed to dry like cement. A stove was often also built from the mud bricks.



THE FARMER TODAY

Many improvements and changes in farming have taken place since the pioneer days. New ways of farming have been discovered and new machinery has been invented.

A. New Ways of Farming

One of the first things was to give up harrowing the summerfallow into a dust mulch so the wind could not blow the soil away. A number of experimental farms were located at different locations in Alberta. Two such farms are located at Vauxhall and Lacombe, Alberta. Can you find these places on the map of Alberta?

The experimenters at these farms began working on the idea that the grain stubble should not be plowed after harvest. Do you know the meaning of stubble? Which answer would you choose? After you have selected an answer look up the word stubble in the dictionary to check your answer. Stubble is:

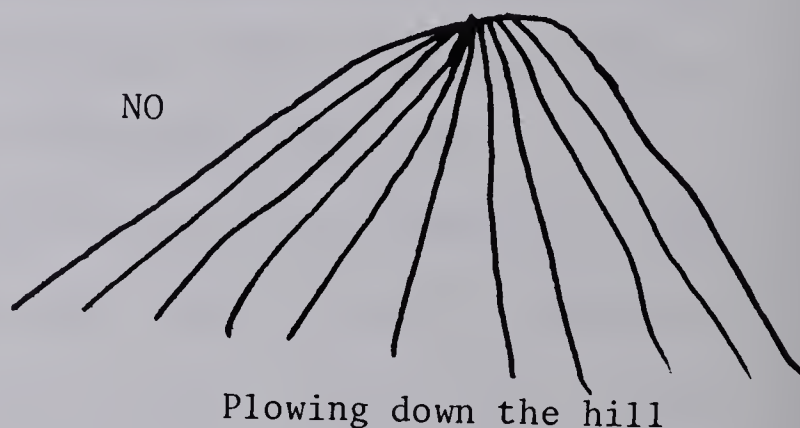
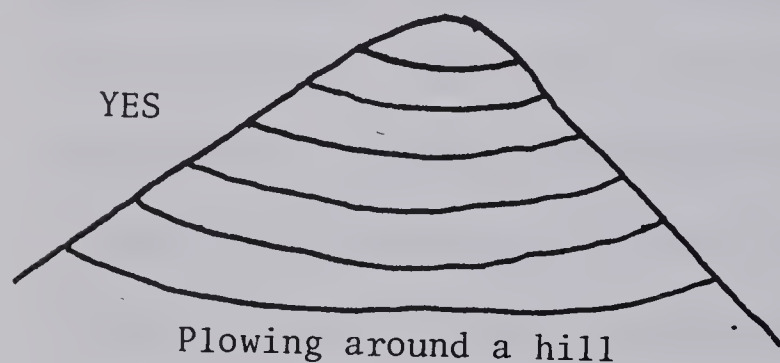
- (a) kind of plow used by farmers today
- (b) a kind of farming method
- (c) short stumps of grass left standing after the harvest

It was decided to leave the stubble standing in the fields. But leaving the stubble meant that the weeds would also continue to grow. The problem was solved by the invention of a new machine called a sub-surface cultivator. This machine is made up of a number of sharp blades which

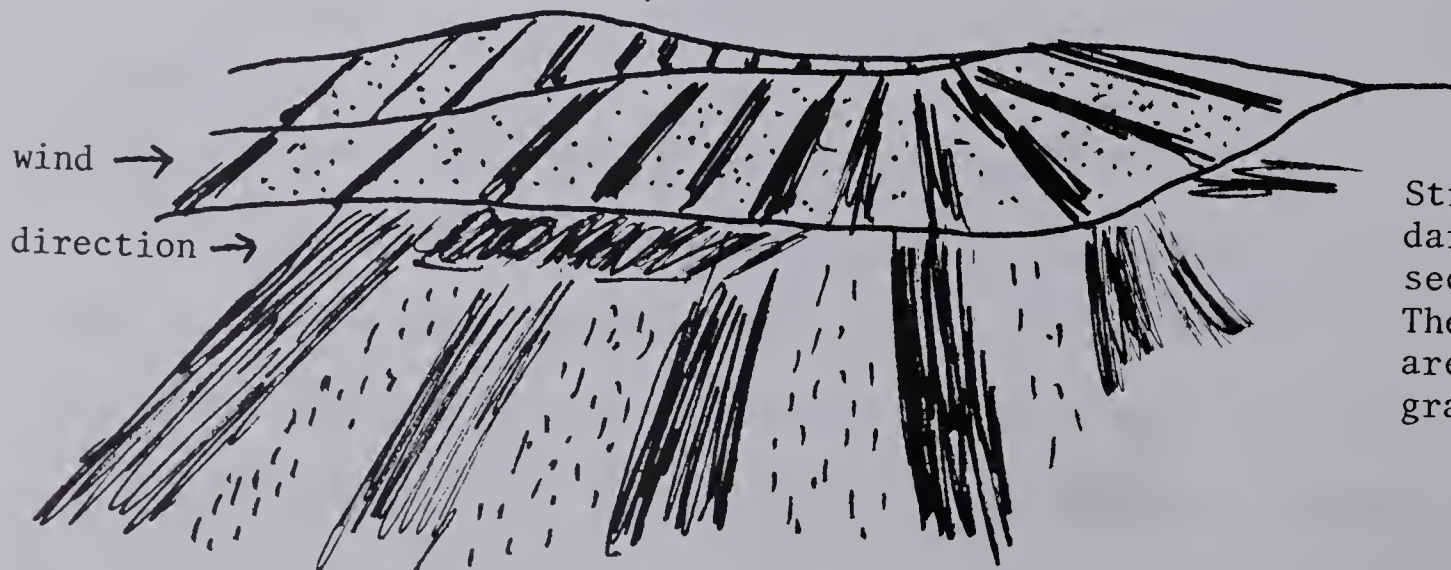
are dragged through the soil. The weeds are cut off at the root level and the stubble on the surface is moved about a bit but not turned over the way the early pioneer plow did.

Another discovery was the use of weedkillers. A weedkiller kills weeds without harming the grain crops. Have you heard of 2-4-D? One weedkiller widely used in Alberta was 2-4-D. Try to find out what it does.

Many farmers also learned to plow their land in ways to prevent and slow erosion. One practice is to plow around hills and not up and down hills.



Farmers also plow in strips at right angles to the wind. A field of strip farming has grain and summerfallow in alternative strips. Watch for such farming the next time you drive in the country.



Strip farming - the dark strips are the sections of Fallow. The lighter strips are the fields of grain.

B. New Machinery and Technology

All the time, improvements in the design of farm machinery were being made, horses were replaced by diesel and gasoline engines and tractors. The new machines were more powerful and more efficient. The new technology has another advantage - speed. Modern machinery can prepare the land so quickly that the seed can be planted without losing time. Also at harvest time the new combine harvesters can harvest the crop very quickly before it rots or is attacked by frost.

Land: Excerpt #11

MOUNTAIN SCENERY AS A NATURAL RESOURCE

The mountain scenery of the Rockies is an important Alberta natural resource. About 53,760 square kilometres of Alberta's forested area is located in national parks. The two most important and famous of these are Banff and Jasper National Parks. The mountains, valleys, lakes, forests and the plant and animal life attract thousands of visitors each year. Tourism is an important industry and earns million of dollars each year.

BANFF NATIONAL PARK

In 1883 a group of early settlers were crossing the Bow River near Banff in a homemade raft. They noticed the smell of sulphur coming out of a hole in the mountain. (Sulphur smells like rotten eggs.) They looked down into the hole and saw an interesting cave. Inside they saw a beautiful green pool surrounded by icicle-shaped formations. These formations were mineral deposits from the sulphur vapour which had been rising from the pool for thousands of years. The hot water in the pool flowed to a natural basin in the rock.

Soon everyone heard about the "healing water" of this mountain district. The Canadian Government decided to investigate the matter. After some thinking the government decided to set the area aside as a park.

Today Banff National Park attracts many visitors. In the winter time people come to ski and swim in the hot

springs. In summer people hike, canoe, climb, bird watch and observe all kinds of animal and plant life.

JASPER NATIONAL PARK

The town of Jasper is located near the site of one of the earliest trading posts in Alberta. It takes its name from Jasper Howes of the North West Company who built the post, which is situated near Lake Jasper, in about 1801.

Jasper came to the mountains of Alberta to buy furs from the Indians who came to his trading post. He lived there for many years. One day he disappeared. Probably he upset his raft or canoe in one of the swift mountain streams.

The trading post stayed and later became the little town of Jasper. Surrounding the town is Jasper National Park, the largest National Park in Alberta. It is a very beautiful park. Animals are protected and plants and trees grow in unspoiled beauty. Many tourists come to see the beautiful scenery and to hike and ski.

WATERTON LAKES NATIONAL PARK

In the southwest corner of the province lies the most colourful national park. The rocks in this park are beautifully coloured. Bands and splashes of gold, green, wine, purple, and red add a beauty which tourists wish to see. There are shale outcroppings of rock up the mountain slopes which glisten in the sunshine like gold.

The country around Waterton was once called the Kootenay Lakes District and was the home of Indian and buffalo. One of the passes through the mountain opened a way for trappers and traders to pass through.

Then came the days of the ranchers and cattle rustlers. The hidden valleys of Waterton made excellent hiding places for stolen herds of cattle and horses of rustlers. At one time oil men came to Waterton to drill for oil which was seeping to the surface.

Today the area is called Waterton-Glacier International Park. Directly south is the Glacier National Park in the United States which joins onto Waterton Park.

Hiking, riding, fishing, motoring, swimming, boating, golfing, tennis and mountain climbing are some of the attractions offered to the many tourists who visit each year.

Land: Excerpt #12

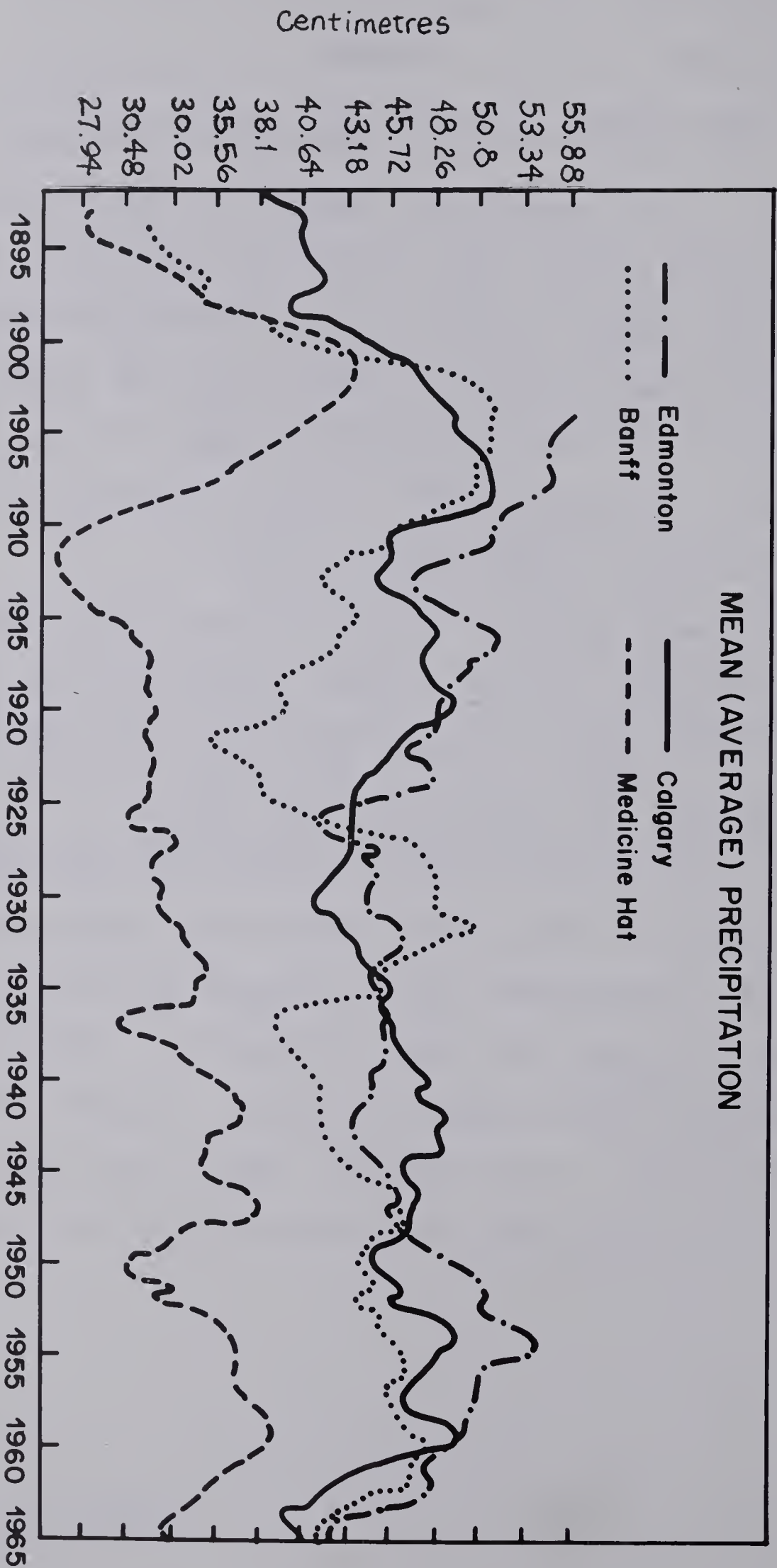
TOURISM

The Alberta tourist industry is important to Albertans. It has grown very rapidly in recent years. More and more Albertans and other people have money and time to travel. Many people decide to visit Alberta's National Parks during their vacation. Alberta has the largest area of provincial and national parks in Canada. It has 5 national parks and 52 provincial parks. Tourists can get to the parks easily because of a good highway system.

Summer visitors to Alberta spend their time camping, swimming, hiking, fishing, picnicing, and sight-seeing. Winter sports attract many tourists to Banff and Jasper. Skiing is a favourite winter sport.

Tourists need places to eat, sleep and park their cars or campers. Many hotels, motels and campgrounds have been built. Restaurants, cafes, garages and service stations are needed to supply the needs of tourists. The government and businesses need to provide highways, airports and other travel facilities. Many Albertans work in the tourist industry to help provide the things that tourists need.

Land : Excerpt #14



WATER

Student

Activity Cards

WATER:

ACTIVITY ONE: Reading to Find the Answer

A. Natural Waters

Instructions:

1. Read the excerpt "Natural Waters" (Water: Excerpt #1).
2. Answer the questions in complete sentences in your scribbler.
 - (a) What is the purest form of natural water available?
 - (b) What is mineral water good for?
 - (c) Why do natural waters contain so many impurities?
 - (d) What type of natural water is not found in Alberta?
 - (e) Why do people and animals need water?

WATER:

ACTIVITY ONE: Reading to Find the Answer

B. Sources of Water

Instructions:

1. Read the excerpt "Sources of Water" (Water: Excerpt #2).
2. Answer the questions in complete sentences in your scribbler.
 - (a) What is the largest lake in Alberta?
 - (b) What is the largest river in Alberta?
 - (c) Name at least four ways that water gets into the rivers and lakes.
 - (d) Why are forests so important to Alberta's water supply?
 - (e) Where do reservoirs get their supply of water?
 - (f) Why is it necessary to store water in reservoirs?

WATER:

ACTIVITY ONE: Reading to Find the Answer

C. Uses of Water

Instructions:

1. Read the excerpts "Uses of Water" (Water: Excerpt #3 and #4).
2. Answer the questions in complete sentences in your scribbler.
 - (a) What do you think were the two most important uses of water for the early Indians? For the early settlers? For today? Why?
 - (b) Can you think of at least five more ways that water is used today? Make a list of the ways that you choose.
 - (c) Some people use more water than other people. Should Albertans restrict how much water a person may use?

WATER:

ACTIVITY ONE: Reading to Find the Answer

D. Drainage System of the Rivers in Alberta

Instructions:

1. Read the excerpt "Drainage System of the Rivers in Alberta" (Water: Excerpt #5).
2. Answer the questions in complete sentences in your scribbler.
 - (a) What direction do most of the rivers in Alberta flow?
 - (b) Name three large bodies of water that Alberta's rivers drain into.
 - (c) Name one Alberta river that flows into each of these bodies of water.
 - (d) Explain in your own words how the rivers cut deep channels into the prairie of Alberta.

WATER:

ACTIVITY ONE: Reading to Find the Answer

E. Irrigation

Instructions:

1. Read the excerpt "Irrigation" (Water: Excerpt #6).
 2. Answer the questions in complete sentences in your scribbler.
 - (a) Why is it necessary to build irrigation projects in Alberta?
 - (b) Where will you find irrigation projects in Alberta?
 - (c) Explain in your own words how irrigation works.
 - (d) How does the farmer control the amount of water entering his land?
 - (e) What other type of system is used to irrigate land in southern Alberta?
-

WATER:

ACTIVITY ONE: Reading to Find the Answer

F. Water Cycle

Instructions:

1. Read the excerpt "Water Cycle" (Water: Excerpt #7).
2. Answer the questions in complete sentences in your scribbler.
 - (a) Is water a natural resource? Why?
 - (b) Is water a renewable or non-renewable resource? Why?
 - (c) Explain in your own words how the water cycle works.

WATER:

ACTIVITY ONE: Reading to Find the Answer

G. Fishing in Alberta's Lakes and Rivers

Instructions:

1. Read the excerpt "Fishing in Alberta's Lakes and Rivers" (Water: Excerpt #8).
 2. Answer the questions in complete sentences in your scribbler.
 - (a) Name three reasons for fishing.
 - (b) What do fish hatcheries do?
 - (c) Why do you think fishing licences are sold?
 - (d) Why does the government put certain restrictions on the fisherman? Do you agree with these restrictions? Why?
-

WATER:

ACTIVITY ONE: Reading to Find the Answer

H. Water Pollution

Instructions:

1. Read the excerpt "Water Pollution" (Water: Excerpt #9).
2. Answer the questions in complete sentences in your scribbler.
 - (a) Why is there a limit as to how much waste material can be put into a stream or river?
 - (b) Why is the amount of dissolved oxygen in rivers so important?
 - (c) What conservation methods are being used to protect Alberta's water supply?
 - (d) Why must industries receive the approval of the Board of Health before they can dispose of wastes in the water?

WATER:

ACTIVITY TWO: Preparing for a Presentation

Choose 1 of the following activities, and in your group plan what you think should be done to help the situation. Prepare a presentation to show what your group thinks. Be sure to let everyone in your group help with the planning of your presentation. Decide how you will present your ideas to the rest of the class. You may use pictures, drawings, charts, reports, murals or models to help you with your presentation.

- (a) Recently, you have noticed that water has been wasted in your school. You are concerned about this. Identify ways to improve the conservation of water in your school.
- (b) Recently, you have noticed that water has been wasted in your community. You are concerned about this. Identify ways to improve the conservation of water in your community.
- (c) You have noticed 5 ways that water in Alberta is being misused. Tell about the 5 ways and suggest how these practices could be corrected.
- (d) You have noticed that the quality of the water in your community is not very good. Prepare a presentation to inform your community of the problem giving suggestions on how they might help to improve the quality of the water.

WATER:

ACTIVITY THREE: Field Trip

If possible take your students on a trip to a water purification plant or an irrigation site. If you are able to plan for this, set up an activity asking the children to prepare a list of questions that they would like to see answered at these sites.

WATER:

ACTIVITY FOUR: Research

Use an encyclopædia or other other available books to find out about one of the following topics:

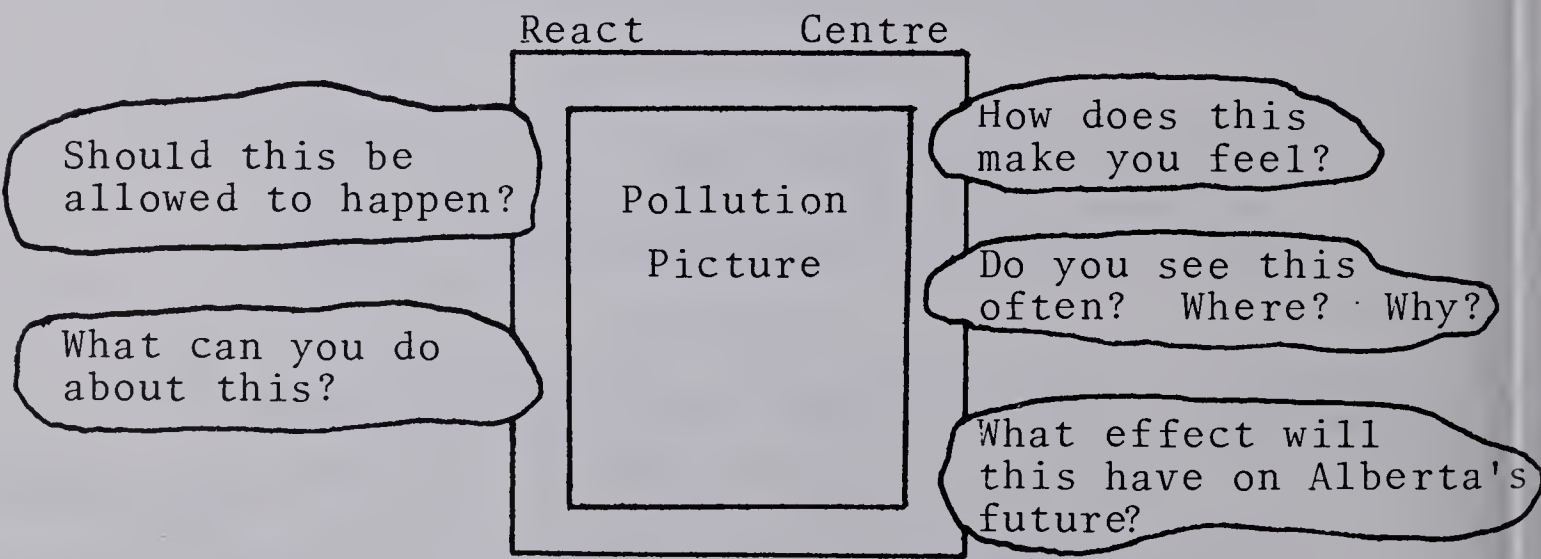
1. Water erosion
2. Flooding
3. Water pollution
4. Irrigation
5. Water purification plants

Write a report about the topic you have chosen. Include pictures and diagrams if you like. Write your report so that it includes enough information that others reading it will understand what you are talking about.

WATER:

ACTIVITY FIVE: React Centre

Find a large picture showing some water pollution. Set it up in the middle of a display board. Around the picture put some questions for the children to think about and to respond to. Invite them to "REACT" to the picture in any form that they choose - perhaps using paragraph, poem, tape recorder, pictures, charts, filmstrip, poster, newspaper story.



WATER:

ACTIVITY SIX: Collage

Have the children look through magazines and cut out pictures showing evidence of people making use of water. Have the pictures mounted on paper or on a box in a collage form. Let the children choose a title for their display e.g. People Need Water - Let's Conserve It. Water is Useful.

WATER:

ACTIVITY SEVEN: Poetry

Try writing a poem about water. One form you might try is called cinquain. Line one has a one word subject, line two has two describing words, line three has three action words, line four has four feeling words, and line five is a word associated with the subject in line one. An example is:

Water
cool, refreshing
dripping, sprinkling, sparkling
Lovely when you're hot
Swimming

Draw a picture to go with your poem when it is finished.

WATER:

ACTIVITY EIGHT: Writing Centre

Pretend that you are early pioneer settlers living in Alberta. You have decided to take your homemade boat and paddle northward along the Athabasca River. As far as you know this route has not been travelled before. Write an account of your adventures as you travel along the river.

WATER:

ACTIVITY NINE: Making Graphs

Let each member of your group list all of the ways that water is used in their homes. Once the lists have been made, make a graph showing how your homes make use of water. Give your graph a title.

WATER

Excerpts

NATURAL WATER

Next to the air we breathe, water is probably the most important thing in our lives. Without it, men, plants and animals would die.

Natural waters are often grouped according to their origin and include rain water, surface water, well water, spring water and sea water. In Alberta we have all types except sea water.

Rain water which also occurs as snow and hail is the purest form of all natural water. As it falls from the clouds, however, it picks up impure substances from the air.

Surface water includes water from rivers, lakes and streams. It is usually less pure than rain water. It picks up many impure substances as it flows over dirt, rocks and vegetation.

Well water comes from wells or holes made in the surface of the earth. People must usually dig down fairly far into the earth to get at this underground water. It was often necessary for the early settlers to dig wells in order to get water which was safe to drink.

Spring water or mineral water usually originates near the mountains. The mineral water can contain minerals such as sulphur which are thought to be useful for healing and refreshing people's bodies.

Sea water is the water which forms oceans. Impure water is constantly draining into the oceans from the rivers and streams which flow into it.

Since natural waters contain so many impurities, towns and cities have built purification plants to clean and purify the water before people drink it.

Water: Excerpt #1

SOURCES OF WATER IN ALBERTA

Albertans get water from the many rivers, lakes, streams, sloughs and creeks which can be found all over Alberta. The river containing the greatest amount of water in Alberta is the Slave River located in the northern part of the province. Lake Athabasca is the largest lake. Only about one-third of this lake is actually in Alberta. The rest is in Saskatchewan. Other large lakes in Alberta include Lake Claire in the northeast and Lesser Slave Lake in the central region. Beautiful Lake Louise in Banff National Park is Alberta's most famous lake. It is estimated that there are about 1,600 lakes in the province, but most of these are very small, unnamed lakes. Many of these lakes are dry for much of the year. Only about 70 of them are good for fishing and only a few are good for swimming.

The amount of water flowing in Alberta's creeks and rivers is not always the same. In most years the majority of the water comes from the melting of snow. The annual snowfall ranges from about 180 centimetres in the northern part of Alberta to 75 centimetres in the south. Lake Louise gets about 400 centimetres of snow each year.

The great snowfall in the mountains would not be of much use to Albertans if the forests on the eastern slope of the mountains did not help to hold the moisture. If the

forests were not there the spring water would rush quickly down the mountains, the rivers would suddenly increase in size but before long the water would disappear. The forests, however, hold some of the water so that it does not all escape at once. Forests also help to shade the earth so that evaporation of water takes place more slowly. Forests are consequently very necessary if we are to make the best use of the water that nature supplies us.

In some years heavy rains also help to increase the amount of water in Alberta's rivers. This is particularly true if the heavy rains occur in spring or early summer when the soil already has plenty of moisture in it. Sleet, hail, frost, dew and fog also contribute some moisture. The average precipitation from all of these forms of moisture, including rain and snow, ranges from 30 to 55 centimetres yearly.

The melting of the Columbia Ice Fields which are located between Banff and Jasper also supplies some of the water to feed Alberta's rivers and lakes.

Dams and reservoirs are built along many of the lakes in Alberta. These reservoirs collect water from our rivers when they are flowing rapidly and they store the water so that it can be used at a later time to provide irrigation water to the southern areas of our province which

receive very little rain during the growing season. Some of the reservoirs of stored water also provide Albertans with hydro electric power.

Water: Excerpt #2

USES OF WATER BY THE INDIANS AND EARLY SETTLERS

The main uses of water for the Indians who roamed the prairie of Alberta were for drinking and for transportation. Settlements were usually set up near a river, lake or spring so that drinking water would be nearby and homemade canoes travelled on the river making it easier for the Indian to move from one place to another.

The early settlers of Alberta used water for many more purposes, but one of the problems facing them was that of getting a good water supply. Sloughs and creeks supplied water for the cattle but wells had to be dug by hand and the dirt had to be hauled away in small buckets or pails.

Before the completion of the railway in 1885, river transportation played an important part in the development of Alberta. Steamboats on the North and South Saskatchewan River carried passengers and cargo to supply the trading posts and settlements that were along the river. At times the rivers were also used to transport troops and supplies when there was a rebellion amongst the Indians. Some early settlers also took their boats and paddled up rivers to explore the new territory around them.

Fur traders also made use of the river to transport their goods when they were trading with the Indians.

River transportation was not always an easier way to move goods. At one time goods going to northern Alberta had to be taken by scow from Athabasca to the northern area. The unwieldy, flat-bottomed, barge-like crafts floated with the current going north, but coming back the barge sometimes had to be hauled upstream by "tracking" teams of seven to ten men wading in the water. Naturally this was very difficult work. Tracking meant putting the crew ashore with a long line to which were fastened pulling harnesses to fit over the men's shoulders. Where the shorelines were muddy or covered with rocks the job became even harder. Later the settlers used water to operate steam locomotives and steamships. Some early settlers also learned to dam small streams so that the flow of water would be diverted to their land and give their crops much needed moisture. Sometimes water wheels were used to divert the water.

In 1883 some prospectors discovered some health giving mineral water in the Banff area. The sulphur water came out of the ground and it was discovered that it was very refreshing to have a "dip" in this water. Early settlers would travel to Banff area just to have a "swim" in this hot, health giving mineral water.

USES OF WATER IN ALBERTA TODAY

Today, as in the past, water is still very necessary for drinking purposes, but it is also used for a variety of other purposes. Some of the ways that Albertans use water today are listed below:

1. The modern home with its facilities for bathing, cooking and washing dishes uses a great deal of water in a year.
2. Some buildings use a heating system with radiators which contain hot water.
3. Car radiators use water to keep them cool.
4. Water is used to preserve and can food.
5. Water is used to wash food and clothes.
6. Water acts as a sterilizer to remove germs from objects.
7. Water is used to water crops and gardens.
8. Water is used to water lawns.
9. Factories use great quantities of water in their many operations.
10. Freight is moved in boats and on barges, particularly in northern Alberta.
11. Air conditioning units depend on water to cool or moisten the air.
12. Science and medicine use chemical formulas which contain water.
13. Water is used to fight most fires.
14. Water is used for floating logs to mills.
15. Water is necessary for irrigation.

16. Water supplies the energy necessary to produce electric power.
17. Water is being used to move equipment for oil exploration in the northern area of the province.
18. Large amounts of water are being pumped underground to help with the recovery of oil and gas.
19. The development of the Athabasca Oil Sands is using a great deal of water.
20. Water is used as a landing strip for cargo-bearing airplanes equipped with pontoons or skis.
21. Some airplanes use the rivers as a route to follow.
22. Ferries carry cars and trucks from one side of a river to the other.
23. Some animals, including ducks and birds, bathe in water.
24. Some animals, such as the beaver, live in the water.
25. Water is used for flushing sewage from our buildings and homes.
26. Water is used for sailing and boating.
27. Water is used for swimming--at lakes and in swimming pools.
28. Water is used for the sports of fishing and water skiing.
29. Frozen water is used for the sports of skating and hockey.
30. Frozen water is used for refrigeration to keep things cool and unspoiled (refrigerated train cars).
31. Water is used in irons to provide steam needed to press clothes.
32. Water is used in the production of soft drinks.
33. Mineral water at Banff is used to bathe in.

35. Water is used to make man-made lakes which provide enjoyment for the people living nearby.
36. Water is used for washing the car.

Water: Excerpt #4

DRAINAGE SYSTEM OF RIVERS IN ALBERTA

The drainage of any region depends upon the slope of the land. In Alberta the land seems to slope in a north easterly direction. The rivers therefore tend to flow north and east. Most of Alberta's rivers eventually drain into the Arctic Ocean, the Hudson Bay or the Gulf of Mexico. As they flow north easterly these rivers have cut deep channels through the plains of Alberta.

The Peace River, for example, begins in the Rocky Mountains and flows towards Lake Athabasca. The Athabasca River has its source in the Columbia Ice Fields near Jasper and it also flows northeast towards Lake Athabasca. From the lake the water continues to flow north until it eventually drains into the Arctic Ocean.

The North Saskatchewan River also has its source in the Columbia Ice Fields. From here it flows easterly through foothills and prairie countryside. High banks can be seen on both sides of the North Saskatchewan River. Beyond Edmonton this river travels in a north-easterly direction to Saskatchewan where the South Saskatchewan river joins it. These two rivers then flow into Lake Winnipeg and then through the Nelson River into Hudson Bay.

The Bow River has its source in Bow Lake near Lake Louise. It flows towards Calgary and just east of Calgary

the river supplies water to the irrigation ditches all along its route. Without these ditches of water the otherwise good growing land would be unproductive.

The Oldman River actually starts from four large creeks that flow down the west side of the Rockies. The point at which these creeks run together is the beginning of the Oldman River. Coal mining was once carried on all along the banks of the river and today it is also used extensively for irrigation. As the Oldman River flows east it eventually meets up with the Bow River. The point at which the Oldman and Bow River meet is where the two rivers become the South Saskatchewan River. The South Saskatchewan River continues to drain in a north easterly direction until it joins up with the North Saskatchewan River. It eventually drains into the Hudson Bay.

The Milk River in southern Alberta flows east across Alberta and then it flows south to join the Missouri and Mississippi Rivers in the United States. It eventually drains into the Gulf of Mexico.

IRRIGATION IN SOUTHERN ALBERTA

Large areas in southern Alberta have excellent soil but very little rainfall. At one time this area was very much like a desert with dust blowing all about. Without irrigation there would be very little farming in this region.

In southern Alberta the soil is deep and fertile and when enough moisture is available it produces large crops of wheat, oats, barley, alfalfa, clover, sugar beets and potatoes as well as all kinds of vegetables and small fruits. Oil-seed bearing crops, including sunflower and rape-seed are becoming more common in this area as well. Trees, shrubs and flowers also grow rapidly on this rich soil when irrigated water is applied.

By adding water to his land, or withholding it, a farmer can control the growth and development of his crops. Since plenty of water is available for watering stock and an abundance of fodder crops can be grown, livestock raising is profitable on an irrigated farm.

In Alberta, dams are built to hold back water during periods when lots of water is flowing so that it can be later used in irrigating farms during dry periods. The water is stored in great artificial lakes called reservoirs. Open

ditches take water from the dams to the farms. Smaller ditches called laterals leave the main ditch at regular places and take the water to the farmer's fields. The farmers are able to open and close special gates known as head gates in the irrigation ditches to control the amount of water they require.

The method by which water is distributed to farm lands is determined largely by the crop. Fields of alfalfa, wheat, and other grains usually are flooded. A small portable dam, made of canvas-covered metal frame or of a sheet of galvanized iron is placed across the ditch to divert the water. This floods a small area of the field. The dam is then moved and the process is repeated until the entire field is flooded. Crops which are planted in rows, such as small fruits, potatoes, corn and beets usually are irrigated by running the water in small ditches between the rows.

It is best if the main irrigation ditch is lined with concrete. This is expensive but it does prevent the loss of water by seepage through the ground. Seepage not only means a waste of valuable water, but it often increases irrigation costs.

One large irrigation project in southern Alberta is located around Bassano. The Bow River supplies the water

for this project. The level of the Bow River was raised about forty feet and a reinforced concrete structure, known as the Bassano Dam was built across the river channel. By means of a concrete aqueduct over 1 kilometre in length the water is carried across a deep depression or dip in the prairie and from here the water flows out to water the crops in the surrounding areas.

The St. Mary-Milk River Dam is another major irrigation project in southern Alberta. Water from the St. Mary River is dammed up to form a huge reservoir at the project.

Some farms in Alberta use portable sprinklers to irrigate the land. Water is carried in a system of sprinkler pipes which are laid above the land. These aluminum pipes spray the area on one or on both sides of the pipe. The sprinkler pipes are usually portable and can be moved from one part of the field to another. Portable systems of this type require more work on the part of the farmer but are far cheaper than permanent installations to cover all of the land.

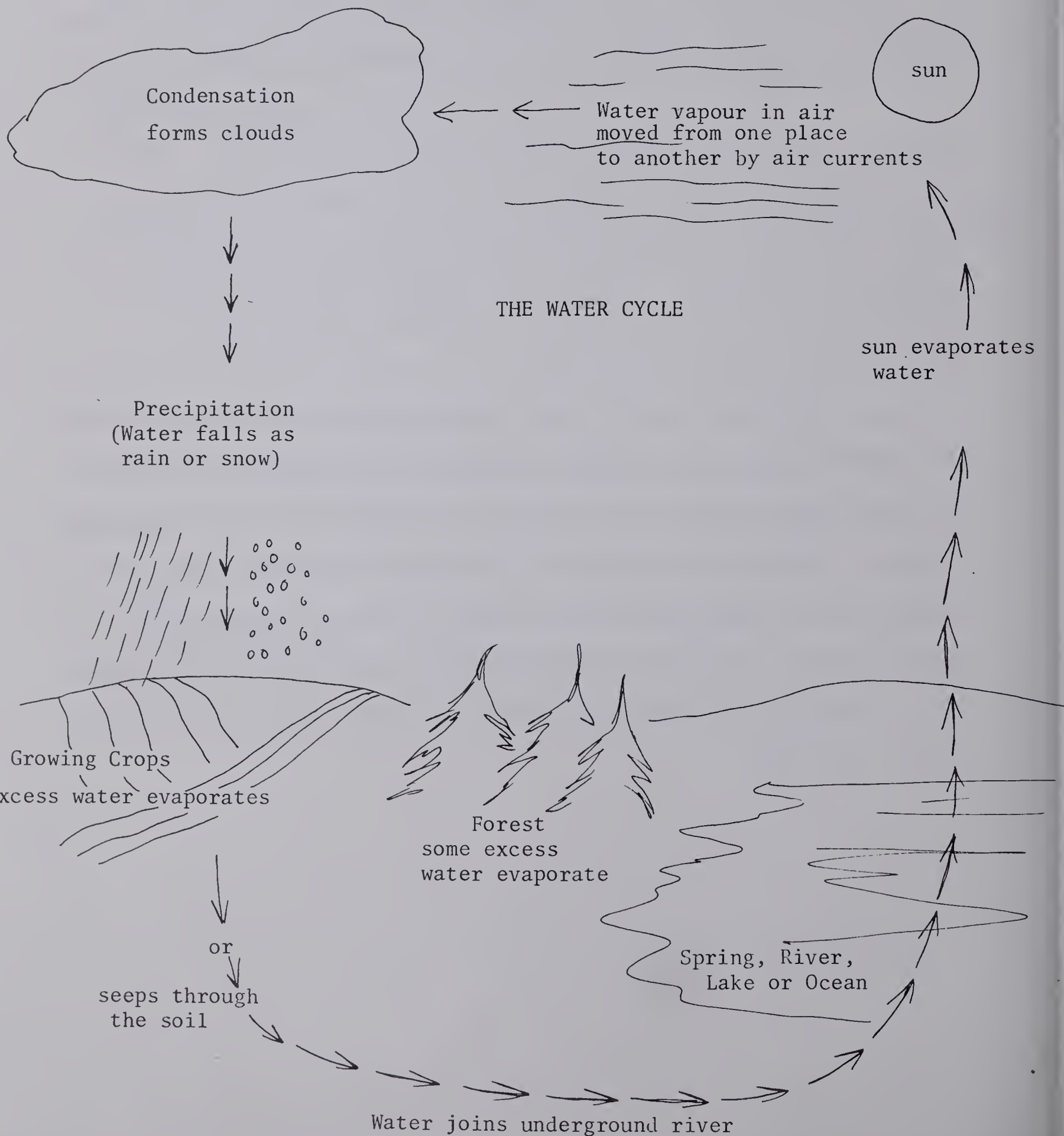
WATER CYCLE

Water can be found in solid, liquid or gaseous forms. As a solid it is found in ice, snow, hail and sleet. In the liquid form it is found in rain, clouds, mist, fog and dew. In its form as a gas it becomes an unseen vapour.

Water in all of these forms is a very important natural resource for man cannot survive without it. Water is a renewable resource for it can be replenished and re-used. This does not mean that Albertans do not need to conserve it however. The water supply of an area can be depleted and it can disappear.

The heat of the sun causes water to evaporate from the earth's surface. When it reaches the cooler air above us, the water vapour in the air is condensed to form mist or clouds. These tiny droplets join together until they form drops heavy enough to fall as rain. This is called "the water cycle." The rain does not fall in the same place as where evaporation took place, because winds blow the clouds across the sky.

The following diagram shows the water cycle - how water evaporates, forms clouds and falls again to replenish our water supply.



FISHING IN ALBERTA'S LAKES AND RIVERS

Fishing in Alberta has usually been done for one of the following three reasons. The first was to provide food for the local markets. For example, the settlers and Indians of Alberta used a large quantity of fish for their own food and for the food of their dogs. Often the Indians dried some of the fish so that it would not spoil and could be used later during the winter months.

The second reason for fishing is to sell the catch and earn some money. Most commercial fishing in Alberta takes place in winter when the fishermen can easily travel on the frozen rivers and lakes. The third and possibly the most important reason is for sport and pleasure. Each year many people spend long hours casting their lines and trying their luck in Alberta's lakes and rivers.

Alberta's best fishing lakes are found in the central and northern areas of the province. Some lakes in Alberta are stocked regularly with small fish in order to keep the lakes supplied with fish. Fish Hatcheries located around the province raise tiny fish from fish eggs. Once the fish are large enough they are taken from the hatcheries and placed in some of the lakes. Some fish are also placed in the irrigation lakes. Whitefish, trout, pike, pickerel,

perch and tullibee are some of the species of fish that are found in the lakes and rivers of Alberta.

In Alberta most fishing is done using a rod, hook and line although some ice fishing and some spear fishing is also done. Special fishing licenses are required for all fishermen except those under 16 or over 65. Fishing licenses generally cost \$5.00 a year and they permit the fisherman to fish at anytime during the day or night and at anytime during the year. Certain restrictions however, are in effect. Some of these include the following:

- (a) Water located on Indian Reserves are only open to public fishing with permission of the Reserve Band Council.
- (b) Alberta fishing licenses are not valid for use in the National Parks of Canada. They are however valid in provincial parks.
- (c) All waters operated by the Fish and Wildlife Division as fish hatcheries and rearing ponds cannot be used for fishing.
- (d) A commercial fishing license is required if a person wishes to capture and offer fish for sale.
- (e) Limits as to the number of fish one person may catch in a day are in effect.

For example, if you are fishing for trout, you may only catch 10 fish a day and you may never have more than 20 fish in your possession at one time.

- (f) Live fish may not be used for bait.

WATER POLLUTION

Alberta's rivers are used to transport waste materials because water is an efficient and economical method of getting rid of undesirable materials. There is a limit, however, as to how much waste material can be put into a river or lake. The Alberta Government has therefore placed restrictions on the disposal of sewage and industrial wastes in order to help protect and conserve the water supply.

Some waste materials that contribute to water pollution include the following: oil refining wastes, chemical wastes, wastes from the lumber industry, human and animal wastes, wastes from decayed vegetable matter and wastes resulting from insecticides and fertilizers.

Probably the most important factor in determining the health of any river is the amount of dissolved oxygen present. Waste materials that are released into streams and rivers need oxygen in order to "break down." The Water Pollution Control Section of the Department of Health sends inspectors out regularly to check the amount of oxygen in Alberta's rivers. By sampling the waste being put into the river as well as the river above the point where the waste enters the water and the river downstream, the effects of the waste material on the stream are determined.

The Department of Health also checks plans for disposal of waste materials every time a new industrial plant wishes to open. Plans for treatment of industrial waste must receive Provincial Board of Health approval before any wastes can be put into the river or lake. Waste materials that are put into the river are usually treated before they are put into the water. This treatment helps to "break down" the material in large underground wells. This also helps to prevent pollution of Alberta's water supply.

The Department of Health also regularly inspects the sewage systems around Alberta. If any pollution problems are found, the city or town must correct the problem. Also, written approval must be obtained for the construction of new waterworks, sewage and solid refuse disposal systems. The government will not give approval unless suitable and adequate measures are included to avoid pollution of the environment.

Swimming pools are also inspected before they open to ensure that they meet proper safety standards. Another was that Alberta's water supplies are supervised is that cities using fluoride in their drinking water must keep daily records of the fluoridation and they must send these reports to the Department of Health for review.

With more and more people moving into Alberta, it is really necessary that the water supply is protected. Safe drinking water will always be needed. Pollution control must be continued.

FOSSIL FUELS

Student

Activity Cards

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

A. How Oil and Gas Were Formed

Instructions:

1. Read the excerpt "How Oil and Gas Were Formed" (Fossil Fuels: Excerpt #1.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) In your own words explain how oil and gas were formed.
 - (b) How does oil travel through porous rock?
 - (c) Why do you think the oil cannot travel through the non-porous rock?
 - (d) Why does natural gas float on top of the oil?
 - (e) What is added to natural gas to make it safer to use?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

B. Discovery of Oil

Instructions:

1. Read the excerpt "Discovery of Oil" (Fossil Fuels: Excerpt #2.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) What is important about the following people and places?
 - i) Kootenay Brown and Waterton Park
 - ii) Turner Valley and Dingman Well
 - iii) Leduc .
 - (b) Where was a large oil find discovered in 1953?
 - (c) What does Alberta do with the oil and gas that she produces? Why is this important to Alberta?
 - (d) Do you think its fair that the oil companies have to share some of their profits (the money they make) with the Alberta Government?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

C. Searching for Oil

Instructions:

1. Read the excerpt "Searching for Oil" (Fossil Fuels: Excerpt #3.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) Name two methods used by geologists in their search for oil.
 - (b) What is a "wildcat" well?
 - (c) What is a "discovery" well?
 - (d) Why is it often difficult to drill a well in Alberta?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

D. Drilling for Oil

Instructions:

1. Read the excerpt "Drilling for Oil" (Fossil Fuels: Excerpt #4.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) What is a tool pusher's job?
 - (b) What do we call the men who work on the rig?
 - (c) What is the purpose of the drilling 'bit'?
 - (d) Why is it such a difficult job to replace the bit?
 - (e) Why is mud so important in the drilling of wells?
 - (f) What is a flowing well?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

E. Transportation of Oil and Gas

Instructions:

1. Read the excerpt "Transportation of Oil and Gas" (Fossil Fuels: Excerpt #5.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) Why do the owners of all lands through which a pipeline will pass have to be paid some money?
 - (b) Why do you think a tractor with a crane is needed to lift the pipe into the ditch?
 - (c) What do the pump stations do?
 - (d) Once a pipeline has been built why does it become the cheapest and most efficient method to transport oil and gas?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

F. Refining of Oil and Gas

Instructions:

1. Read the excerpts "Refining of Oil and Gas" (Fossil Fuels: Excerpts #6 and #7.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) What is the purpose of refining?
 - (b) What does the heat in the furnace do to the crude oil?
 - (c) What is the heaviest product given off during the refining process?
 - (d) What do you think are the most interesting things that are made from oil or petroleum? Why did you pick these items?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

G. How Indians Used Oil and Gas

Instructions:

1. Read the excerpt "How Indians Used Oil and Gas" (Fossil Fuels: Excerpt #8.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) How did the Indians know that oil existed?
 - (b) Name at least 2 ways that the Indians used oil or gas.
 - (c) Why didn't the Indians use as much oil as we use today?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

H. How the Early Settlers Used Gas

Instructions:

1. Read the excerpt "How the Early Settlers Used Gas" (Fossil Fuels: Excerpt #9.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) Why were the early gas wells so dangerous?
 - (b) Why did Medicine Hat leave its gas lights burning during the day?
 - (c) Name at least 3 ways that the early settlers used natural gas.

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

I. "Oil" Sands

Instructions:

1. Read the excerpt "Oil Sands" (Fossil Fuels: Excerpt #10.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) What are oil sands?
 - (b) Where are the oil sands of Alberta located?
 - (c) Why is it so expensive to mine the oil sands?
 - (d) Why is Fort McMurray becoming a boom town?
 - (e) What problems do you think Fort McMurray will have in order to meet the needs of all the people coming to live there?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

J. Alberta's Syncrude Project

Instructions:

1. Read the excerpt "Alberta's Athabasca Oil Sands Projects" (Fossil Fuels: Excerpt #11.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) Why do you think Albertans are mining the "oil" sands even though it is a very expensive business?
 - (b) What is Syncrude?
 - (c) What happens to trees and animals when the "oil" sands are being mined? Do you think this is a problem? Why or why not?
 - (d) Explain in your own words what you think royalties are?
 - (e) Do you think Albertans should have formed Syncrude? Why or why not?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

K. Alberta Oil and Gas Conservation Board

Instructions:

1. Read the excerpt "Alberta Oil and Gas Conservation Board" (Fossil Fuels: Excerpt #12.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) What is the Alberta Oil and Gas Conservation Board"? What does it do?
 - (b) Why isn't natural gas burned or 'flared off' today?
 - (c) Do you think it is good for Alberta to have a Board like this to help conserve our oil and gas supplies? Why or why not?
 - (d) What do you think would happen if Alberta's oil and gas supply ran out?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

L. How Coal Was Formed

Instructions:

1. Read the excerpt "How Coal Was Formed"
(Fossil Fuels: Excerpt #13.)
2. Answer the questions in complete sentences
in your scribbler.
 - (a) In your own words explain how
coal was formed.
 - (b) What kind of coal is the best
kind of coal?
 - (c) How is hard coal formed?
 - (d) Where can we find the hardest
or best kind of coal in Alberta?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

M. Mining Coal

Instructions:

1. Read the excerpt "Mining Coal" (Fossil Fuels: Excerpt #14.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) Who was the first person in Alberta to discover coal?
 - (b) Where was the first coal mine in Alberta?
 - (c) How much of Canada's coal is found in Alberta?
 - (d) What types of coal mining methods are used in Alberta? In your own words explain how one of them works.
 - (e) What conservation practices are used by coal mining companies today?

FOSSIL FUELS:

ACTIVITY ONE: Reading to Find the Answer

N. The History of Alberta's Coal Industry

Instructions:

1. Read the excerpt "The History of Alberta's Coal Industry" (Fossil Fuels: Excerpt #15.)
2. Answer the questions in complete sentences in your scribbler.
 - (a) How was coal used before 1950?
 - (b) Why was there a decline in the use of coal after 1950?
 - (c) What is happening to the production of coal today? Why?
 - (d) Why do you think Alberta does not sell its coal to Ontario?

FOSSIL FUELS:

ACTIVITY TWO: Reading a Map

A. Oil, Gas, Oil Sands Map

Instructions:

1. Read excerpt #16 showing where oil and gas fields and the oil sands are located.
- 2.- Answer each question in a complete sentence in your scribbler.
 - (a) Where are the largest oil fields located? Name the closest cities to the oil fields.
 - (b) Where are the largest gas fields located? Name the closest cities to the gas fields.
 - (c) Are there more oil fields or more gas fields?
 - (d) Where are the "oil" sands located? Name the closest cities to the "oil" sands.

FOSSIL FUELS:

ACTIVITY TWO: Reading a Map

B. Main Pipelines, Refineries and Gas Plants

Instructions:

1. Read excerpt #17 showing where the main pipelines, refineries and gas plants are located.
2. Answer each question in a complete sentence in your scribbler.
 - (a) Are there more gas processing plants or more oil refineries in Alberta?
 - (b) Which city do most of the oil and gas pipelines lead to?
 - (c) Some of the pipelines lead right to the border of Alberta. Where do you think they go from there?

FOSSIL FUELS:

ACTIVITY TWO: Reading a Map

C. Main Oil and Gas Pipelines in Canada

Instructions:

1. Read excerpt #18 showing the main oil and gas pipelines in Canada.
2. Answer each question in a complete sentence in your scribbler.
 - (a) Where do you find most of the oil and gas fields of Canada?
 - (b) What do the arrows on the map of the oil pipelines show?
 - (c) What do the arrows on the map of the gas pipelines show?
 - (d) How many oil refining centres are in Alberta?
 - (e) How many oil refining centres are in Saskatchewan?

FOSSIL FUELS:

ACTIVITY TWO: Reading a Map

D. Coal Map

Instructions:

1. Read excerpt #19 showing the coal regions of Alberta.
2. Answer each question in a complete sentence in your scribbler.
 - (a) Around which city do you find most of the coal producing mines?
 - (b) What kind of coal do you find near Lloydminster?
 - (c) What kind of coal do you find near Drumheller?
 - (d) What type of coal do you find near the Rocky Mountains?
 - (e) Are there any coal deposits near Fort McMurray?

FOSSIL FUELS:

ACTIVITY THREE: Reading a Diagram

A. Formation of Oil and Gas

Instructions:

1. Look at diagram showing formation of oil and gas, excerpt #1.
2. Answer each question in a complete sentence in your scribbler.
 - (a) What is the purpose of the porous rock?
 - (b) What is the purpose of the non-porous rock?
 - (c) Is water, natural gas or oil the lightest substance? How do you know?
 - (d) Which is the heaviest substance? How do you know?

FOSSIL FUELS:

ACTIVITY THREE: Reading a Diagram

B. Rotary Drilling Rig

Instructions:

1. Look at diagram showing rotary drilling rig, excerpt #4.
2. Answer each question in a complete sentence in your scribbler.
 - (a) Why would a drilling rig be difficult to set up?
 - (b) What do you think the casing would be?
 - (c) How is the drill pipe extended as the bit goes further into the ground?
 - (d) How do you think the crew know when they have hit oil?
 - (d) Why does the bit have such rough edges on it?

FOSSIL FUELS:

ACTIVITY THREE: Reading a Diagram

C. Oil Refining

Instructions:

1. Look at diagram showing oil refining, excerpt #6.
2. Answer each question in a complete sentence in your scribbler.
 - (a) Which one of the products formed from crude oil is the heaviest?
 - (b) Which product is the lightest?
 - (c) What do you think the cooler does to the crude oil?
 - (d) Which product do you think is used by most Albertans? Why do you think so?

FOSSIL FUELS:

ACTIVITY FOUR: Research

CHOOSE ONE OF THE FOLLOWING TOPICS TO REPORT ON

- A. Use an encyclopædia to find out about the following kinds of coals: anthracite, bituminous, lignite. Tell about any interesting information you might discover.
- B. Find out at least 5 uses of oil, 5 uses of natural gas and 5 uses of coal. Use available books and articles to give you this information. List your information on a chart.

Use of Fossil Fuels		
Oil	Gas	Coal

- C. Use an encyclopædia or available books to discover how an underground coal mine operates. Use a paragraph diagram or picture to record your information.
- D. Use an encyclopædia or available books to discover how a natural gas refinery works. Use a paragraph, diagram or picture to record your information.

FOSSIL FUELS:

ACTIVITY FIVE: Writing a Paragraph (choose 1)

- A. Tell in your own words how an oil rig and drill work.
- B. Why is exploring and drilling for oil so expensive?
- C. What would be some of the consequences if Alberta's oil supply ran out?
- D. Describe conservation methods used in Alberta's oil industry.
- E. Why is the development of the oil industry in Alberta important to the province and to Canada as a whole?
- F. How has the oil boom changed the appearance of the land in Alberta?

FOSSIL FUELS;

ACTIVITY SIX: Pretend and Create (choose 1)

- A. Pretend you were a pioneer businessman living in Calgary long ago. You have agreed to help Mr. Herron drill his well. Tell a story about your adventures (refer to excerpt #2.)

OR

- B. Pretend you are "rough neck" on a modern day oil rig. Tell about one day in your life while working on the oil rig (refer to excerpt #4.)

OR

- C. Make a poster advertising the wise use of fossil fuels.

OR

- D. Pretend you are a mayor of a "boom town" such as Fort McMurray. Tell of the problems that are created when a major oil discovery is made near your town. How would you solve them?

FOSSIL FUELS:

ACTIVITY SEVEN: Retrieval Chart

Make a retrieval chart similar to the following.
Explain to someone what your chart tells you
about these natural resources.

	Oil	Gas	Coal
1. How fossil fuel was formed			
2. How fossil fuel is mined			
3. How fossil fuel is transported			
4. How fossil fuel is used today			
5. How fossil fuel is conserved			

FOSSIL FUELS:

ACTIVITY EIGHT: Looking at Artifacts

Set out samples of sedimentary rocks, shale, core samples, oil sands, coal and crude oil.

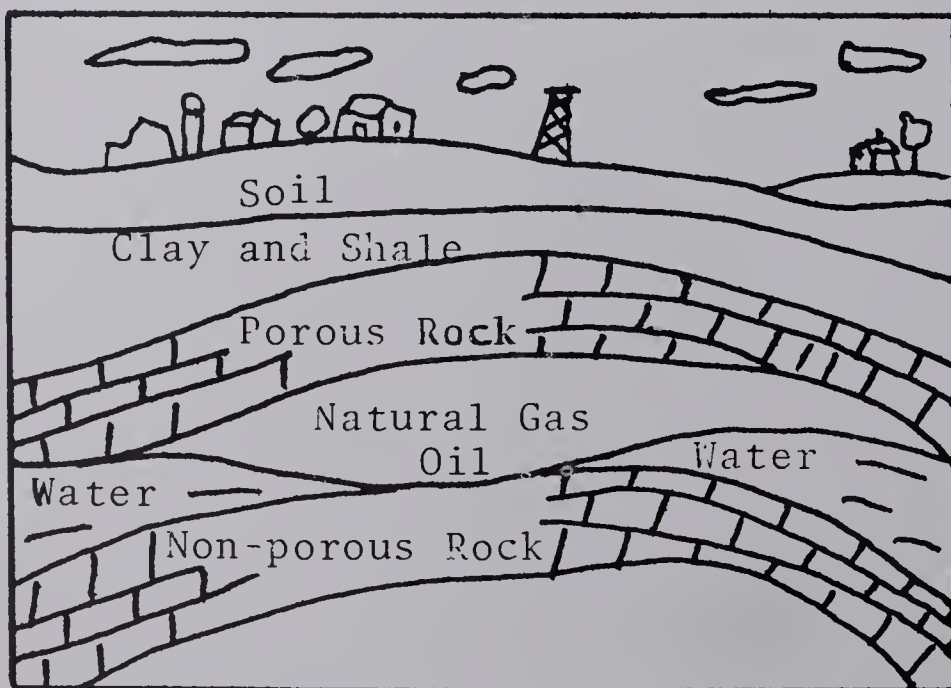
1. Look at each of these artifacts.
2. Describe what each one is like.
3. See if you can find evidence of fossils in any of them.
4. Tell where each of these samples can be found.

FOSSIL FUELS

Excerpts

HOW OIL AND GAS WERE FORMED

Most scientists think that oil and gas were formed from the bodies of tiny animals that lived in sea water millions of years ago. Alberta was once covered by these sea waters and as the tiny animals in this water died, they fell to the sea bottom. As years went by, these sea creatures were crushed under great loads of dirt, rock and water. The land even rose and fell. As more time went on, the pressure became greater and greater on the bodies of the tiny sea creatures. After millions of years, this great weight and the heat caused by it, turned the sea creatures into petroleum or "rock oil" and some of it into natural gas. All of this pressure also caused the oil to move. It travelled through tiny holes in porous or sedimentary rocks until it became trapped in dome-shaped rock formations as illustrated in the following diagram.



Sometimes the oil is located as much as three or more miles below the surface of the earth. Natural gas is sometimes located at the same spot as the crude oil. The gas is lightest so it floats on top of the oil. Natural gas is colourless and odourless. People add an odour to it as a safety precaution against the danger of explosion or people being poisoned by breathing the gas.

Fossil Fuels: Excerpt #1

DISCOVERY OF OIL

Approximately 100 years ago a tribe of Indians noticed oil seepage on Cameron Creek. (Cameron Creek is located in Waterton National Park.) Nearby, an early settler who was called Kootenay Brown had staked out a homestead. While Brown was ranching in the Waterton area the Indians told him about the oil seepages on Cameron Creek. He skimmed oil from the creek to use in greasing his farm machinery.

He dug trenches or pits and waited for the oil to seep into these depressions. He then dipped the oil into containers and sold it for \$1.00 per gallon to his neighbours.

A second man, Mr. Aldridge, a Mormon who lived in the same area, applied for a lease to drill for oil. A company called "Rocky Mountain Development Company" was formed and they began to drill for oil. At about 1000 feet down they hit oil. One day the well caved in and the men lost all their tools. The men lost interest and the well was abandoned.

Today the old well site of Alberta's first oil well is in the center of Waterton National Park. (Look for the drill stem and wooden winch which mark the place of the first oil well in Alberta the next time you visit Waterton National Park.)

Soon oil was discovered at a second place in Alberta. During the early years of this century, pioneer settlers again noticed oil and gas seepages on their land. Mr. William Herron who was a rancher south of Calgary, decided to drill a well on his ranch. Because he needed money and help, he invited Calgary businessmen to join him in forming a company. One of these men was Senator Lougheed! (Do you know an Albertan who is related to Senator Lougheed?) The Calgary Petroleum Company started drilling and soon a well "blew in". It was called the "Discovery Well" strike. The well was the famous Dingman well. It blew in at Turner Valley in the year 1914 and it produced both oil and gas.

An oil boom hit Calgary. Everybody wanted to buy oil stocks and form oil companies. Citizens stood in line for hours. So much money flowed that clothes-baskets were used to hold the bills! One man even used a wheelbarrow to haul his money to the bank!



\$500,000.00 was
spent in one day

Some people were bitterly disappointed and lost their money. Other people were lucky and made money. From this point on, the oil industry slowly grew. Wells were discovered near Taber, Lethbridge, Lloydminster and Bragg Creek. By 1939, Albertans were producing more oil than they could use. In this year Alberta began to sell oil to other provinces and countries. World War II came along and the Turner Valley fields produced great amounts of oil and gas that were used to help win the war. Gasoline made from crude oil was in short supply around Alberta, however.

The biggest oil boom was still to come. On February 13, 1947, oil was discovered in the town of Leduc, near Edmonton. Imperial Oil drilled one hundred and thirty-three dry holes over a period of thirty years before they struck this most important well. Thirty-five of the forty wells drilled during the first year of the Leduc field became producers. Over the next few years, oil continued to be discovered all around the Leduc area. Redwater also became an important field.

In 1953, the discovery of oil at Pembina, southwest of Edmonton, touched off the biggest drilling boom ever experienced in Western Canada. The Pembina field is located in the area around the town of Drayton Valley.

The next major production area of oil and gas wells was in the Swan Hills area. Later, in 1965, there was a strike at the Rainbow Lake-Zama area of northern Alberta.

Today the province of Alberta owns most of the mineral rights to the land and they receive income from leases, rentals and royalties (share of the profits). The oil and gas industry of Alberta has really helped to make the province one of the richest provinces in Canada.

Alberta produces about two-thirds of Canada's petroleum and about four-fifths of Canada's natural gas. Pipelines carry Alberta's oil and natural gas throughout Canada and into the United States.

SEARCHING FOR OIL

The search for oil requires much skill, patience and equipment. Geologists study the rocks and aerial photographs to learn more about the structure of the land. They might spend months on the land looking for clues. Core drilling is an important method used. A special portable drill cuts cores out of the rocks and brings them to the surface. These rock samples are studied carefully and catalogued and preserved. Seismology is helpful in the search for oil. By this method, man-made earthquakes are set off by exploding dynamite in a hole. The shock waves "bounce" from the layers of rock below, back to the surface, where they are measured on a seismograph. The time they take to bounce back can be measured in thousands of a second. This enables the geologists to estimate the depths of the rocks below and to learn the shapes of underground formations.

Drilling is the real test of success in the search for oil. Exploration in areas where no previous wells have been drilled is called "wildcat" drilling. Many wildcat wells prove to be failures; neither oil nor gas is found.

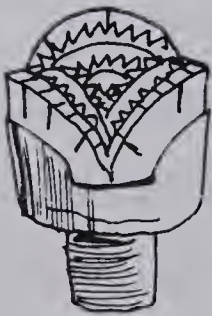
If enough oil or natural gas is found, the well is called a discovery well.

Oil crews must often drill in forested areas as well as in muskeg. Sometimes they are lucky and they can drill on the prairie. Some areas cause a lot of extra work for the crews. Roads must be built, supplies and equipment must be brought in and land must be cleared. Sometimes new towns are also built if the discovery is large enough to produce oil and gas over a great length of time.

Fossil Fuels: Excerpt #3

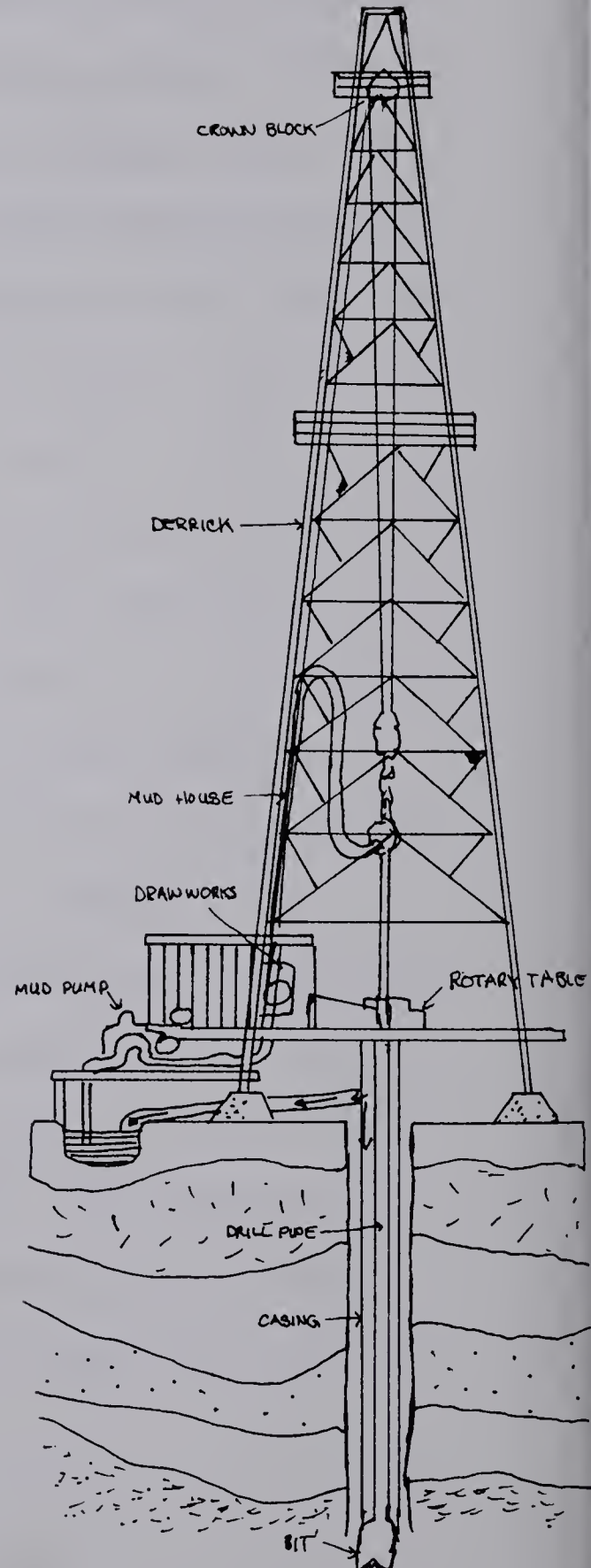
DRILLING FOR OIL

Drilling rigs operate twenty-four hours a day. One man called a tool push, is the supervisor in charge of the rig. During each eight-hour shift at least five men are working on the rig. They are called - drillers, derrickmen, motormen, floormen (rough-necks). The driller operates the controls and supervises the crew. The derrickman mixes the drilling fluid. The motorman is responsible for the mechanical condition of all equipment. The two floormen assist as required.



Drill Bit

This diagram shows an oil rig and a drill. Many sections of pipe are kept near the drill for



its length will have to be extended as it goes farther into the earth in search of oil. Attached to the end of the drill pipe is the drilling bit. The bit is used to cut through the soil and rock formations below the surface of the earth. When cutting through rock the bit often becomes dull and must be replaced. This is a difficult task for the bit must be brought to the surface in order for it to be changed. All the sections of the drilling pipe must be disconnected and piled up in one corner of the derrick, only to be connected again and lowered once the bit has been changed. Engines help to raise and lower the drill and to rotate it in the hole.

Drilling fluid, usually called mud, continuously flows down the inside of the drill pipe, through the bit and up to the outside of the drill pipe. Larger pumps called mud pumps enable the mud to flow freely. The mud helps to lubricate and cool the drilling bit and it carries many rock cuttings back up to the surface. The mud deposits a thin layer on the walls of the hole and this helps to prevent the hole from caving in. Since the mud is heavy it also helps to prevent water and oil from escaping. Once the mud returns to the surface the rock particles are removed and then it is used again. When drilling, the crew sometimes find oil and natural gas, sometimes they find just oil or just natural gas, sometimes they find water and sometimes they have a dry

hole. They just don't find anything!

Producing wells are of two types - flowing or pumping. In a flowing well, water or gas pressure forces the oil to the surface. A wellhead can be used to control the amount of oil and gas that escape. Some wells, however, need a pump to help bring the oil to the surface. The pump can control how much oil is brought up at one time.

After an oil well has been drilled, provincial laws require that once the crews remove the drilling rig they must restore the land to the way it was before the drilling took place.

TRANSPORTATION OF OIL AND GAS

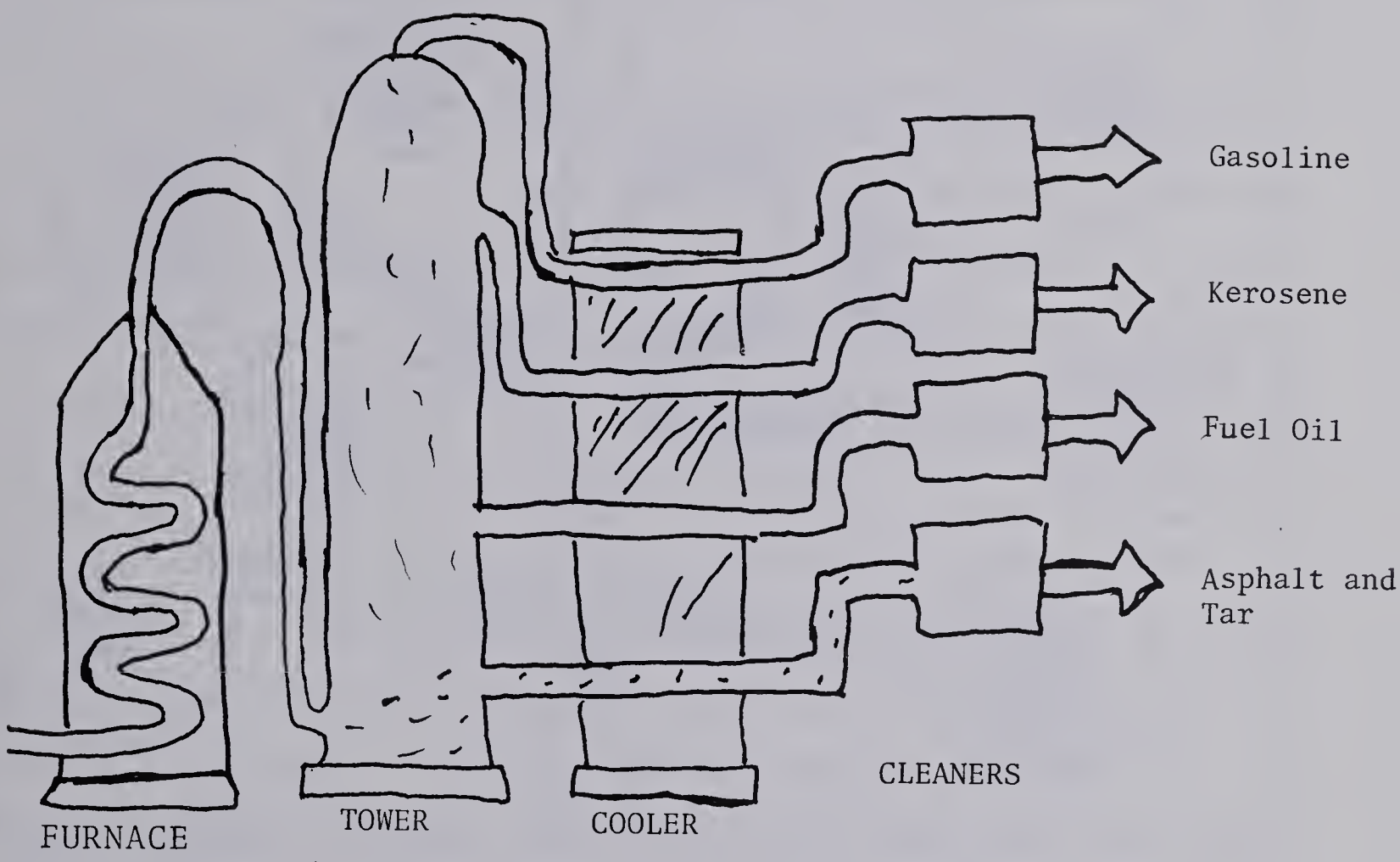
Once oil and gas have been found, they must be transported and refined. Tanks, trucks, railway cars and oil tankers are all used, but pipelines have become the cheapest and most efficient method. Construction of a pipeline, however, is very expensive. First, a good route must be found and surveyed. Often this pipeline must extend to other provinces in Canada and to the United States so that other communities can make use of oil from Alberta. The owners of all lands through which a pipeline will pass must be paid some money for the inconvenience the pipeline will cause them. Ditching machines then come and dig trenches of the exact width and depth required. Truckers and welders haul in lengths of pipe and join them together. Following this, a wrapping machine that covers the pipe with a coating of asphalt and felt to protect it from corrosion will be used. A tractor with a crane is usually used to lift the pipe into the ditch. Finally, the earth is replaced and soon the land looks much as it did before. Pump stations must also be erected approximately every 30 - 80 miles along the pipeline to help keep the oil moving through the line. Some pumping stations do not require a worker to operate them. It really costs very little to keep the oil flowing through the pipeline once it has been built.

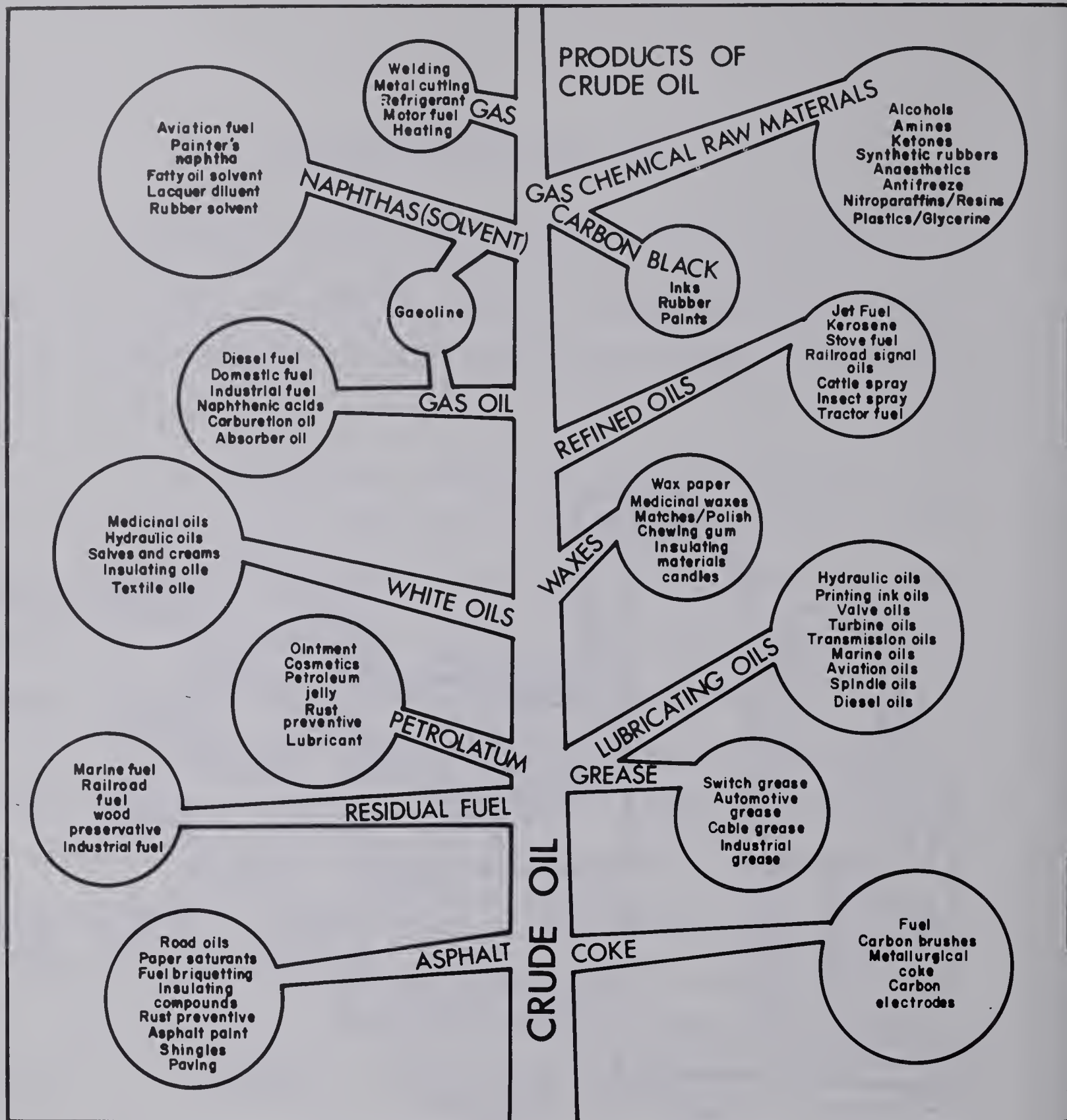
REFINING OF OIL AND GAS

Crude oil, as it comes from the well, is not of much use to man. It must be sent to refineries where it is changed into a number of oil products by a process known as "distillation."

At a refinery the crude oil, or petroleum, is passed through coiled pipes which are located inside a very large and very hot furnace. The great heat in this furnace changes the oil to a gas or vapour. This gas travels to a bubble tower where the parts of the oil separate according to their weight. The heavier products sink to the bottom and the lighter ones bubble to the top. Pipes lead each of the petroleum products through a cooler and a cleaner. Gasoline, kerosene, fuel oils, tar and asphalt are the main products given off. Some of these products are later broken down into other products which can be used more effectively by man.

Before natural gas is piped to customers, it is also sent through a maze of towers, tanks and connecting pipes where it is filtered and cleaned. An odour is also added to protect people in case the natural gas leaks.





HOW INDIANS USED OIL AND GAS

In the late 1700's (approximately 200 years ago) Indians had discovered places where oil and gas were seeping up to the surface of the ground. Some seepage spots were found around the Athabasca River, along the North Saskatchewan River near Edmonton, and in the southern part of Alberta which today is Waterton National Park.

There is very little evidence to indicate that the early Indians knew very much about the oil and gas in Alberta. Only where oil had seeped through the rocks and soil to the surface did Indians become aware that the black "oily earth" existed. Thus oil was not used by the Indians in large quantities the way Albertans use it today.

However, Indians found some uses for the sticky, "oily earth". The Indians in Alberta used horses and travois to move from place to place but sometimes they had to cross rivers and streams. Alberta Indians did not use bark and dugout canoes. Instead, they built rafts and constructed bull boats out of skins and willow. The black, sticky, oily earth was used to seal the seams of the bull boat.

The Indians also used the oil as a healing ointment. Indian squaws spread the thick, black liquid onto cuts and wounds to help them heal. If a child cut his leg or an Indian warrior was bleeding from an arrow wound or wild animal attack, the healing oil was spread over the wound.

A story is told as to how one of the early white men found out about oil. Mr. Lafayette French was riding in the foothills around Waterton Lakes when he was wounded in the leg in a hunting accident. An Indian squaw treated the injury with thick, black liquid which smelled like kerosene. His leg healed very well. He asked the Indians to show him where they had found the liquid. The Indians showed a stream into which the healing oil oozed. It was oil!



BULL BOAT

HOW THE EARLY SETTLERS USED GAS

The early Alberta settlers gradually became aware of gas deposits. Sometimes discoveries came about by accident. The story as to how Albertans became conscious of the presence of gas is an interesting one. In 1883 the Canadian Pacific Railway was being built across the prairies. It was necessary to drill for water along the tracks to supply the steam locomotives. During the drilling of a well near Medicine Hat, gas was discovered.

In 1890 another group of settlers were digging in search of coal and again found a considerable amount of gas. More and more gas wells were dug.

The early wells did not have a cement casing. As a result, gas often seeped through the earth and created a fire hazard. Sometimes severe explosions shook the ground.

The settlers discovered that the gas could be used for fuel to heat homes, cook food, and light streets. By 1900 Medicine Hat had gas light on the streets. The lights burned day and night! The gas was so cheap it did not pay to hire someone to turn the lights off each morning and on again at night.

The gas was also used in some of the early industries. At Redcliff, six miles from Medicine Hat, a glass plant, brick plants and steel mills were constructed. Soon

the gas was being piped to other cities to be used for street lights, cooking food and in industry. By 1905 Calgary was using gas piped from the Medicine Hat area.

Fossil Fuels: Excerpt #9

OIL SANDS

Oil is usually found in underground wells from which it is piped to the surface and on to refineries. But Alberta also has large deposits of Oil Sands. These deposits of bitumen have the oil mixed with sand. The oil sands of Alberta are found in the Athabasca area. (Find Athabasca on a map of Alberta.) Experts estimate that these oil sands contain enormous quantities of oil.

The cost of obtaining the oil from the sands is very expensive. First, huge bulldozers and shovels remove the rocks and dirt on the surface. Then the sticky oil-saturated sands are moved to a processing plant. Here they are placed in large settling tanks to separate the oil from the sand where the mixture is heated to allow the oil to flow to the surface and be skimmed off.

When the oil sands are too deep to make it possible for bulldozers and shovels to clean the surface, the ground is heated. The sources of heat are high voltage electricity, heated water and ultrasonic waves. The oil sands are heated to a temperature high enough to allow the oil to flow into underground wells. From these wells it is pumped to the surface.

Fort McMurray is the centre of the Athabasca Oil Sands mining and processing plants. It has become a boom town as many people have come to work in the area.

Fossil Fuels: Excerpt #10

ALBERTA'S ATHABASCA OIL SANDS PROJECTS

Alberta has two plants producing oil from the Athabasca oil sands near Fort McMurray.

Great Canadian Oil Sands, a member of the Sunoco group started production in 1967 after many years of study and experiment. Debentures to raise money for the building of this plant were offered to Albertans only, and were all sold out long before everyone wishing to purchase them could be supplied.

In 1978 a second plant was completed and began production. This was Syncrude Canada Ltd., which also was many years in the study and planning stages before it was decided to go ahead and build a plant for the extraction of the heavy, sticky oil from the sands. Syncrude consisted of a consortium of Oil Companies, along with financing from the Alberta Government.

Both G.C.O.S. and Syncrude used Bechtel Engineering as their contractors. Bechtel was able to innovate and incorporate many improvements and refinements to the oil extraction process for Syncrude, that they had learned by trial and error when building the G.C.O.S. plant.

It is very expensive to mine the Athabasca oil sands. Syncrude alone cost over \$800 million to build.

A pipeline carries the finished product from both plants to Edmonton and then through other large pipe-lines to eastern Canada and the United States.

The mining of the oil in the sands will make the following possible:

1. Royalties of many millions of dollars, payable to Alberta each year.

Do you know what royalties are? (Clue: what are profits?)

2. Many thousands of new jobs for Albertans in all trades and services.
3. Growth of Fort McMurray into a large centre.

However, there are also disadvantages to consider.

1. Is it right for Albertans to allow a natural resource to be used so quickly?
2. Is it right to disturb the animals and plants living in the oil sands area? The area around Fort McMurray is on the major flying routes for birds migrating north and south each year. Many hectares of forests will be cut down and cleared away to make room for the mining operations. What happens to the animals?
3. Can Fort McMurray build enough houses, schools, stores and churches to meet the needs of all the people who work for Syncrude and G.C.O.S.?

ALBERTA OIL AND GAS CONSERVATION BOARD

The Alberta Oil and Gas Conservation Board was set up in 1938 to control the use of the oil and gas resources of the province and to prevent the waste of the oil and gas resources.

The employees include engineers, geologists and technicians and one of their jobs is to study every oil and gas field in the province. A records department maintains a file on each well in the province. In fact, an oil company must apply to the board for a licence to drill a well. Once a licence is granted, drilling operations are supervised by Board employees.

Once a well starts producing, the Board regulates how much crude oil may be taken from the well each month. How much is allowed depends on how much is needed to meet the demands of the market. The Board divides the estimated total market each month among all the wells in the province. This is a means of preventing waste and assuring a fair share of the market to all oil companies.

Gas conservation is also an important part of the Board's work. In the early years of the oil industry in Alberta, the gas was often burned or "flared off" as waste because there was no market for it. Today, however, we now have many uses for natural gas and it is important that it

be conserved for future use. The Oil and Gas Conservation Board helps to see that it is not wasted.

Fossil Fuels: Excerpt #12

HOW COAL WAS FORMED

Many, many years ago much of Alberta had a tropical kind of climate. Thick lush vegetation grew everywhere. The sea flooded areas so that large swamps and bogs were formed. Heavy deposits of soil, silt, rocks and mud covered the plants and vegetation. The weight of all these layers pressed the plants into hard layers of coal. This change took place over a very long time.

There are harder and softer kinds of coal. The hardness of coal depends upon weight of the layers on top of it and the length of time the coal is buried. Along the mountains there was extreme pressure and here we find the best coal.

MINING COAL

Peter Fidler discovered coal along the Rosebud Creek near Drumheller in the year 1791. The first person, however, to begin mining coal in Alberta was Nicholas Sheran. He opened the first coal mine on the banks of the Oldman River near Lethbridge during the 1870's. Sheran transported his coal by ox cart to Fort Benton in the United States. Coal from the region was also used in the locomotives of the Canadian Pacific Railway. Shortly after this, some of the early settlers of Alberta experimented in shipping coal by barge on the canals and rivers between Lethbridge and Medicine Hat. Now coal is usually transported by train.

Today over one-third of Canada's coal is found in Alberta. There are coal beds at Crowsnest, Nordegg, Red Deer, Grande Cache, Drumheller, Wabamun and Forestburg.

Much of Alberta's coal lies fairly close to the surface. When coal is near to the surface, it is mined by the strip-mining method. In strip-mining two hundred-foot-thick layers of rock and earth are removed to uncover the coal. The coal is then shovelled into trucks. For every ton of coal mined, as much as seven tons of earth and rocks are moved! As the strip-mining continues, large open pits are dug with a huge winding road around the edge for the trucks and machinery to use.

The machinery used in strip-mining is enormous. The dragline machine has a boom as long as a football field. The dragline removes the soil that lies on top of the coal. Electrically operated shovels load the coal into two-hundred-ton trucks called "deuces". These deuces have a loading box equal in size to a large classroom. Their full loads of coal sometimes reach as high as fifty feet! Each truck tire costs around \$10,000. (Compare this to the cost of your family car.) And each truck burns over 2,000 litres of gas per day. The trucks take the coal to be loaded onto trains and ships.

Other companies mine coal by the hydraulic method. In this operation the coal is broken loose from the rock by high-pressure jets of water. The coal is washed down the hillside to large screening tanks. The screening tanks are filled with water. In the screening tanks the coal is separated from the pieces of rock and dirt. Before shipment, the coal is broken into small pieces and dried for transportation.

Some underground mining is still done in Alberta, particularly in the Rocky Mountain area. In this type of mining a shaft is sunk down from the surface of the ground. Mining of this type can be dangerous. The walls and roof of the mine are supported by large beams and gas or explosives

are used to loosen the coal. An electric loader is used to haul the coal back up to the surface.

Since mining for coal uses such large equipment, the surrounding land is often destroyed. Plant life in particular, suffers. Mining companies are now attempting to restore the natural environment. For example, trees and shrubs are being planted to prevent water erosion and to beautify the land. Grass is also being planted. Another conservation practice that they are using is the recycling of the water used in hydraulic mining.

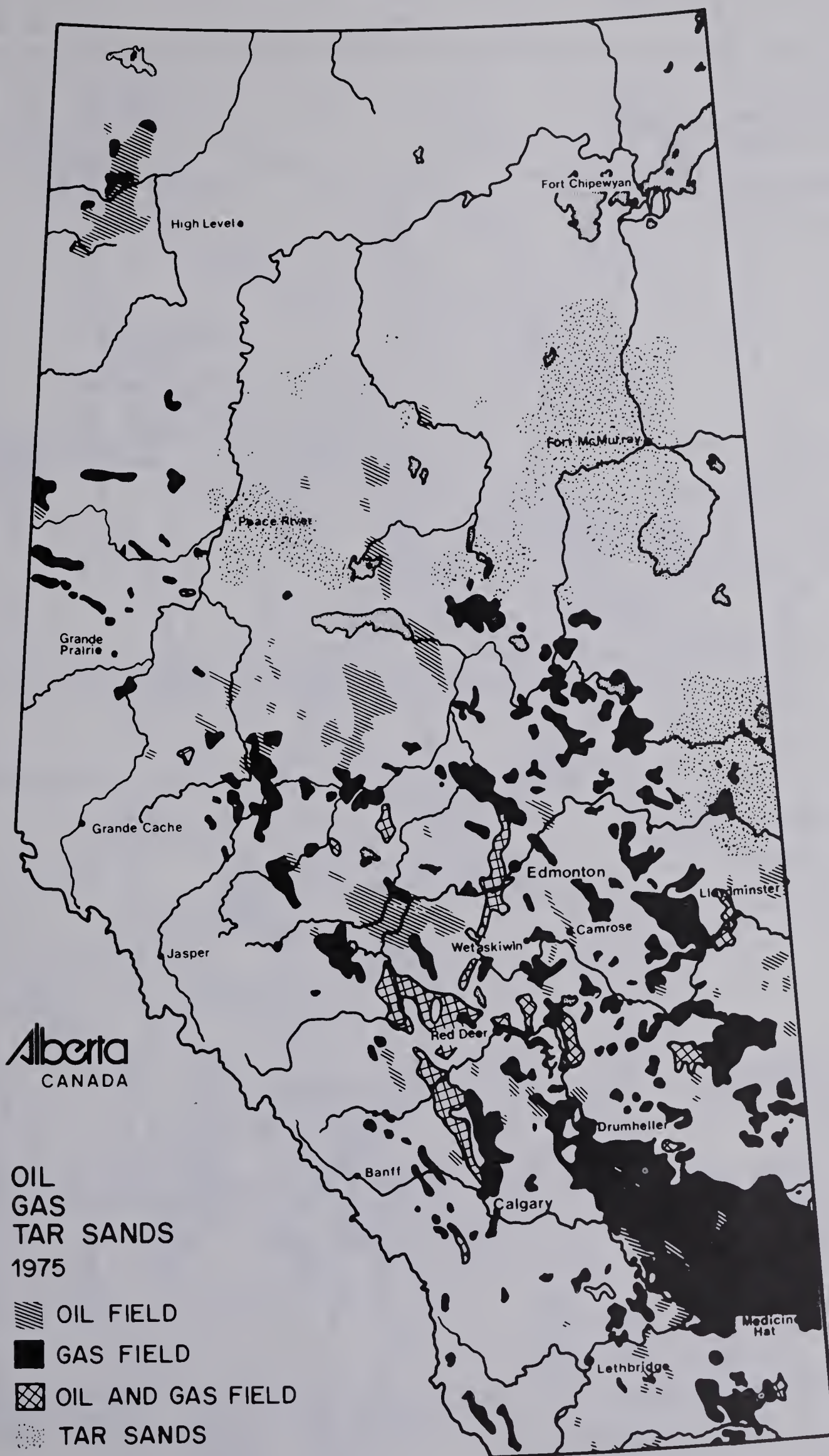
THE HISTORY OF THE ALBERTA COAL INDUSTRY

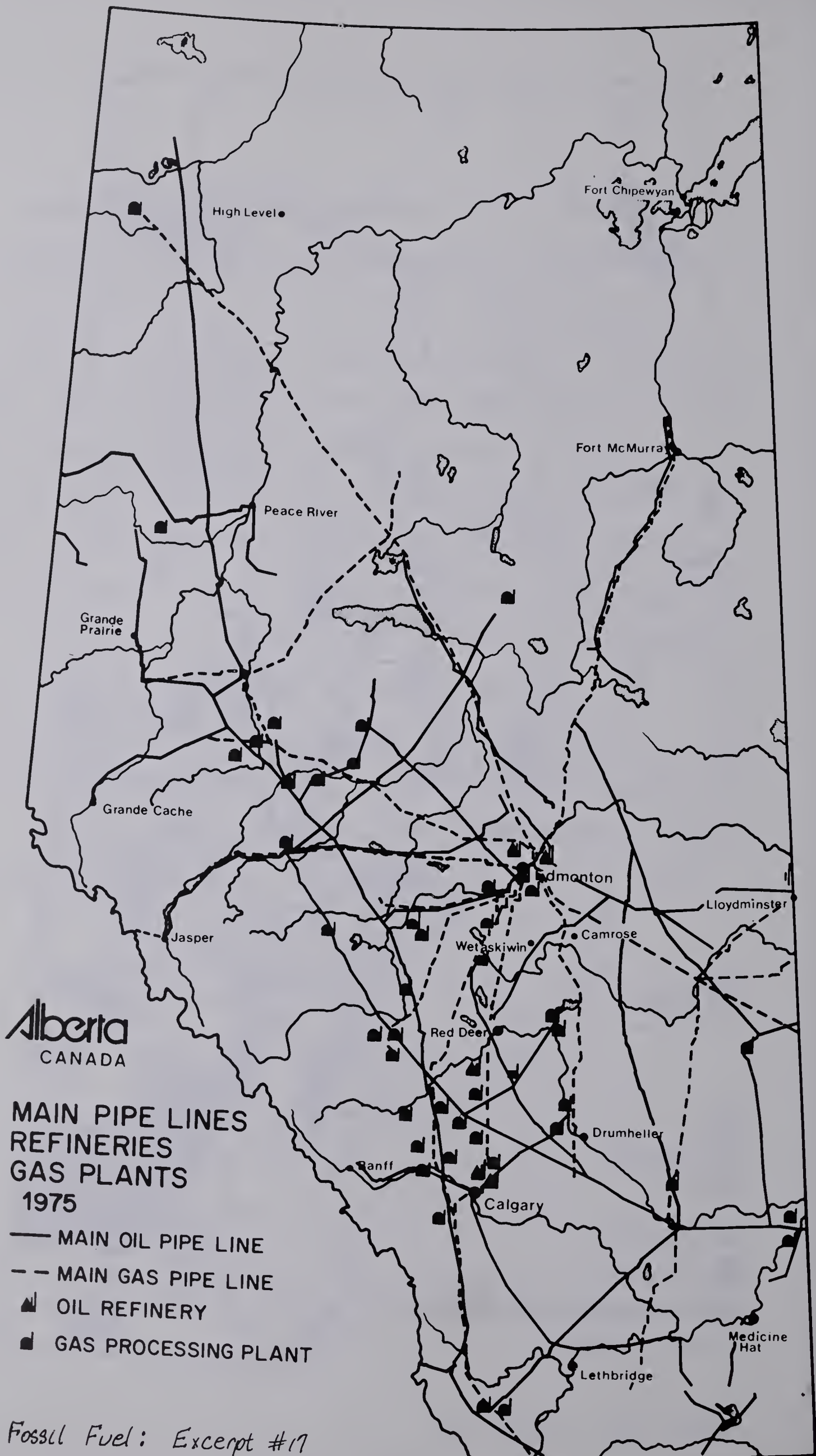
The history of the Alberta coal industry can be divided into three periods. First there is a period of development from pioneer days to 1950. After 1950 Albertans did not buy as much coal and many mines had to close. At this time "ghost towns" developed as many people moved away from the coal mining towns in search of new jobs.

Why did Albertans need less coal after 1950? There are several reasons why less coal was needed. First the steam locomotives on the railway were replaced by the new diesel locomotives. Second, cheap supplies of gas and oil were available for heating homes and offices. Today, new markets have again increased Alberta's production of coal. Thermal plants for generating electric power were built at Wabamun and Forestburg and these plants use coal to produce the electricity. Present forecasts indicate that by 1980 Alberta could be using 10 million tons of coal yearly for electric power generation. It is interesting to note that new coal operated power plants are now being asked to meet more demanding pollution control requirements. This is being required by the Energy Resources Conservation Board. If it is possible for them to do so, existing plants are also being notified to meet current pollution standards.

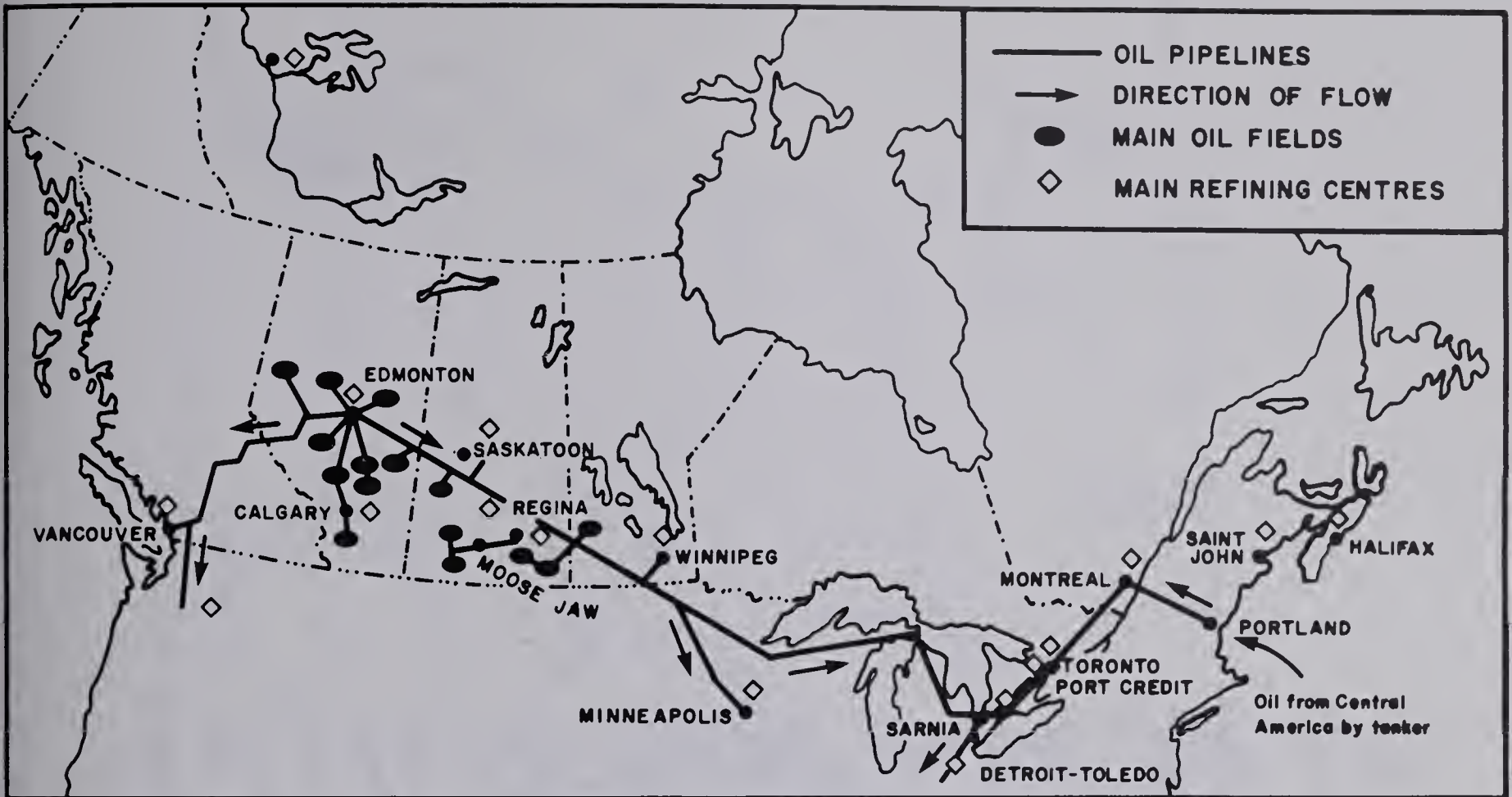
Another market for Alberta's coal is for the steel mills of Japan. A fifteen-year contract has been signed to supply five million tons of coal a year to Japan. The Alberta Resource Railway was a special railway constructed during the 1965-67 period to carry coal from Alberta to the Japanese freighters waiting at Roberts Bank a seaport near British Columbia. Much of the coal being sold to Japan comes from a coal deposit at Grande Cache. A new "model" town was built at Grande Cache to serve the mining industry.

By 1975 over one-half of the total production of coal in Canada was for export to other countries. It is interesting to note that even though Canada exports or sells a lot of coal, Ontario imports or buys coal from the United States. Some people are wondering why Alberta coal cannot be shipped to Ontario!

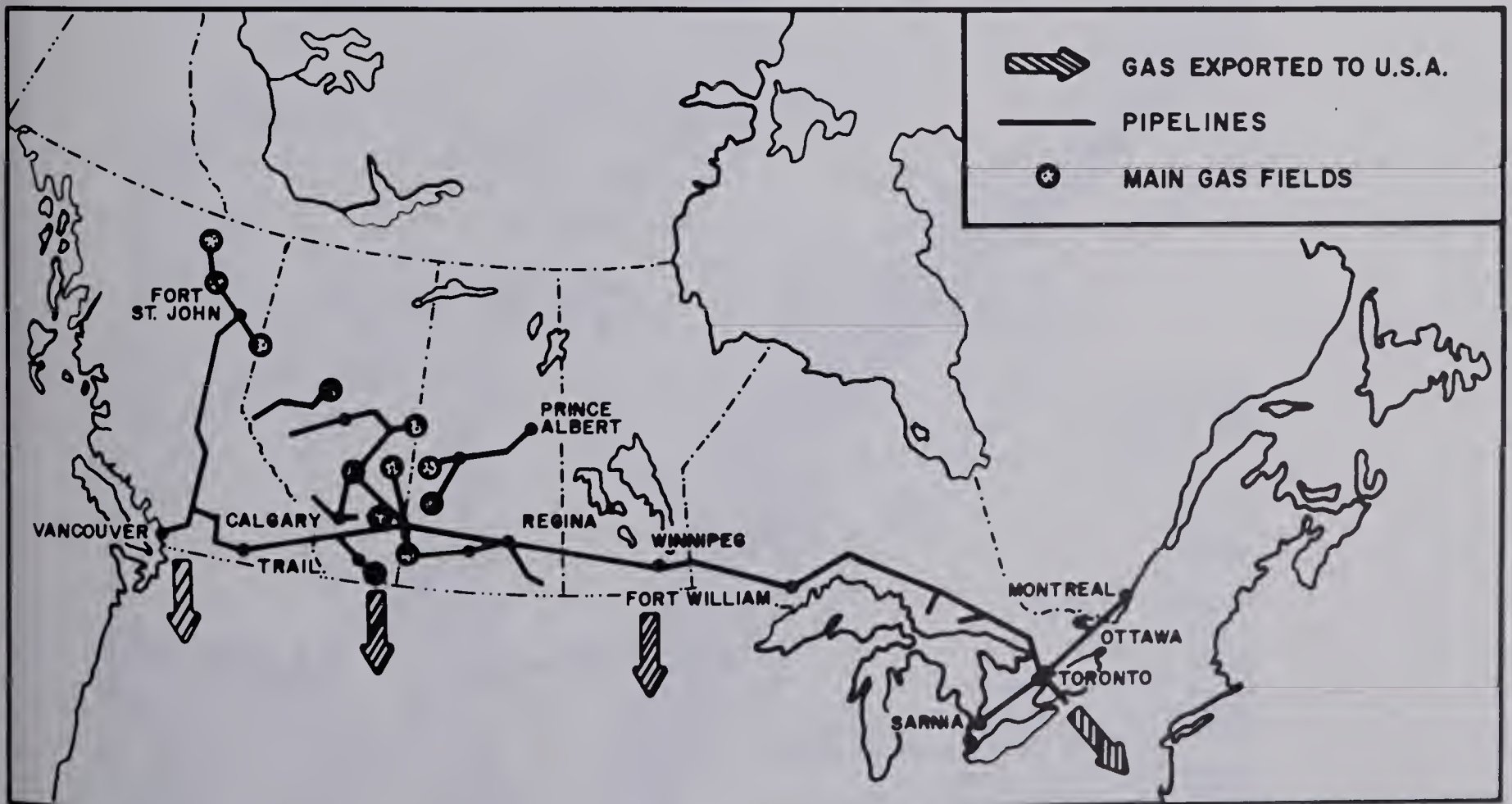




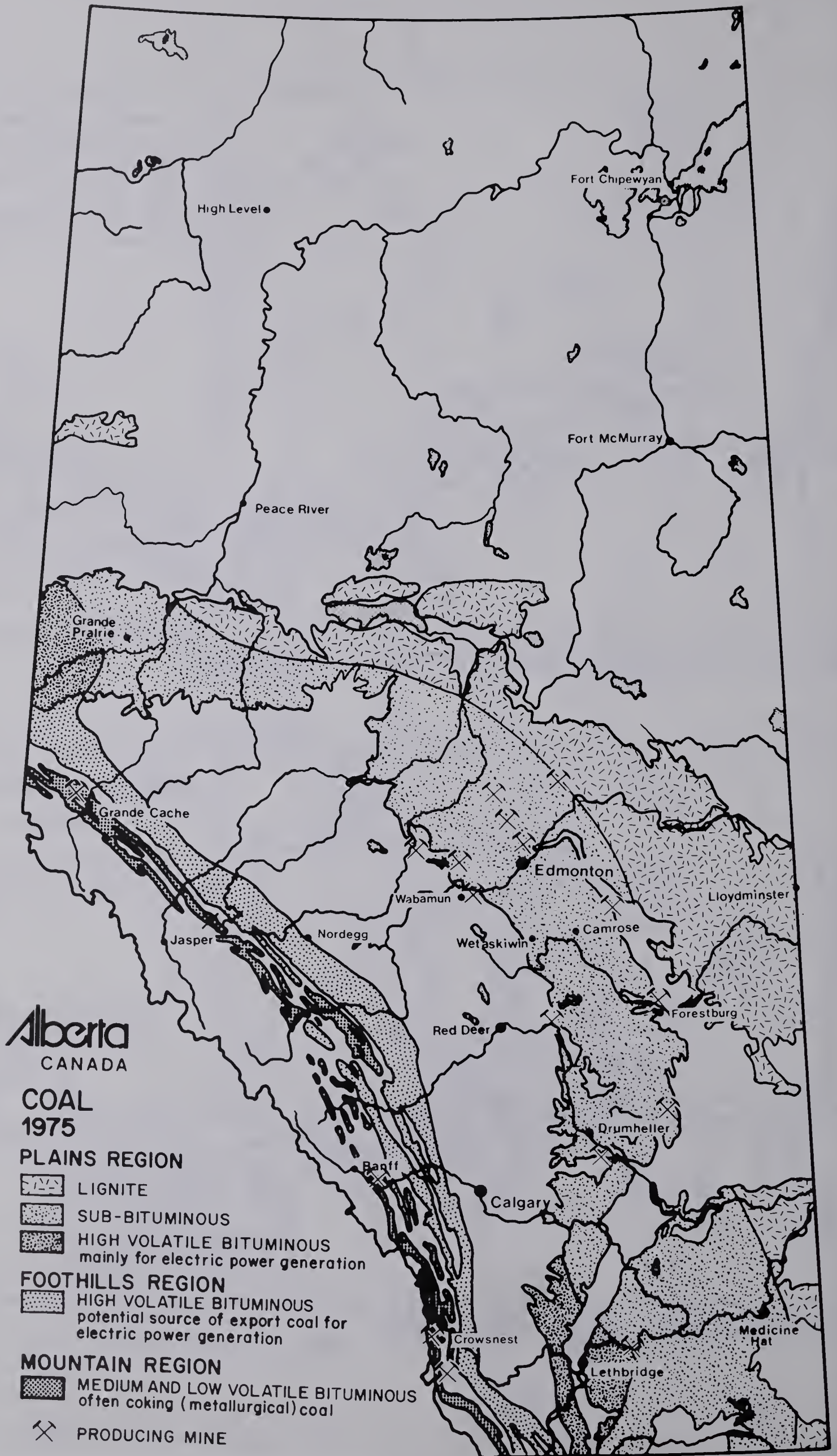
Fossil Fuel: Excerpt #17



MAIN OIL PIPELINES AND REFINERY CENTRES.



MAJOR NATURAL GAS PIPELINES.



ANIMALS and PLANTS

Student

Activity Cards

ANIMALS AND PLANTS:

ACTIVITY ONE: Reading to Find the Answer

A. The Importance of Plants and Trees

Instructions:

1. Read "The Importance of Plants and Trees" (Animals and Plants: Excerpt #1).
2. Answer the following questions in complete sentences in your scribbler.
 - (a) List four ways trees and plants are important to us.
 - (b) Why do plants and trees need to have sunshine?
 - (c) Why do we need plants in order to stay alive?
 - (d) Read the excerpt very carefully to try to find the meanings of the following words. Now tell in your own words what you think each one means:

photosynthesis

chlorophyll

ANIMALS AND PLANTS:

ACTIVITY ONE: Reading to Find the Answer

B. Forestry

Instructions:

1. Read "Forestry" (Animals and Plants: Excerpt #2).
 2. Answer the following questions in complete sentences in your scribbler.
 - (a) What are the two kinds of trees in Alberta?
 - (b) List two places where pulpmills are located in Alberta.
 - (c) Describe five steps of the pulpwood operation in correct sequence.
 - (d) How do companies make strong paper?
 - (e) List the benefits from the forest which you have in your classroom
-

ANIMALS AND PLANTS

ACTIVITY ONE: Reading to Find the Answer

C. Benefits of the Forest

Instructions:

1. Read "Benefits of the Forest" (Animals and Plants: Excerpt #3).
2. Answer the following questions in complete sentences in your scribbler.
 - (a) List four uses of wood at home.
 - (b) List four uses of wood at school.
 - (c) List four uses of wood in business.
 - (d) Explain why wood is so important to us.

ANIMALS AND PLANTS:

ACTIVITY ONE: Reading to Find the Answer

D. Trees of Alberta

Instructions:

- 1. Read "Trees of Alberta" (Animals and Plants: Excerpt #4).
- 2. Draw the following chart in your scribbler and fill in the answers.

TREES OF ALBERTA	
Name of Tree	Major Use of Tree
Black Spruce	pulpwood

ANIMALS AND PLANTS:

ACTIVITY ONE: Reading to Find the Answer

E. Conserving Our Forests

Instructions:

1. Read "Conserving Our Forests" (Animals and Plants: Excerpt #5).
2. Answer the questions in complete sentences in your scribbler.
 - (a) What is the timber quota system?
 - (b) Why is the timber quota system needed?
 - (c) Who owns all the forests in Alberta?
 - (d) What is the meaning of reforestation?
 - (e) Who is trained at the Forestry Training School?
 - (f) Is it important for the government to try to protect the forests? Why or why not?

ANIMALS AND PLANTS:

ACTIVITY ONE: Reading to Find the Answer

F. The Forest Ranger and Farmer Work Together

Instructions:

1. Read "The Forest Ranger and Farmer Work Together" (Animals and Plants: Excerpt #6).
2. Answer the questions in complete sentences in your scribbler.
 - (a) Tell of two ways the forests are useful to the farmer.
 - (b) What is irrigation?
 - (c) Why is irrigation needed to grow crops in some parts of Alberta?
 - (d) What types of farms are located in irrigated areas?
 - (e) How do the forest ranger and farmer work together?

ANIMALS AND PLANTS:

ACTIVITY ONE: Reading to Find the Answer

G. Mammals of Alberta

Instructions:

1. Read "Mammals of Alberta" (Animals and Plants: Excerpt #7).
2. Answer the questions in complete sentences in your scribbler.
 - (a) Tell about two changes in mammal life since the early Indian and settler days.
 - (b) Look up the word extinct in a dictionary. Then tell in a sentence what you think extinction means.
 - (c) Why does the government control the killing of animals by allowing hunting only in hunting seasons?
 - (d) Why do animals need to be protected?
 - (e) Do you think that the government should pass laws regarding the hunting and trapping of animals? Why or why not?

ANIMALS AND PLANTS

ACTIVITY ONE: Reading to Find the Answer

H. Game Preserves and Bird Sanctuaries

Instructions:

1. Read "Game Preserves and Bird Sanctuaries"
(Animals and Plants: Excerpt #8).
2. Answer the questions in complete sentences in
your scribbler.
 - (a) Why does the government set aside areas
where no shooting or hunting is permitted?
 - (b) What is protected at
 - (i) Elk Island Park
 - (ii) Wood Buffalo Park
 - (iii) Nemiscam Park
 - (c) What is a bird sanctuary?
 - (d) Do you agree that game preserves and bird
sanctuaries should be provided? Why or
why not?

ANIMALS AND PLANTS:

ACTIVITY TWO: Research

A. Mammals of Alberta

Instructions:

1. Select a mammal living in Alberta.
2. Use an encyclopædia or reference book to locate information on the mammal you have selected.
3. Record your information in report form under the following headings.

The Title

- (a) Description of the mammal (appearance).
 - (b) Habitat (where does it live? On the ground? Underground? Southern Alberta? Northern Alberta?)
 - (c) Habits (what does it eat? When?)
 - (d) Animals usefulness to us (clothing, food, sport, beauty, etc.)
4. Add pictures, illustrations, charts or maps to your report. Share your report with your group.

ANIMALS AND PLANTS:

ACTIVITY TWO: Research

B. Trees in Alberta

Instructions:

- 1. Use your dictionary to find the meanings of the following words:

coniferous deciduous
- 2. Use each word in a sentence.
- 3. Complete the chart below. Use "Trees in Alberta" (Animals and Plants: Excerpt #4) to classify the kinds of trees in Alberta under the correct heading.

TREES IN ALBERTA	
Coniferous	Deciduous
1. 2. 3. 4. 5.	

ANIMALS AND PLANTS;

ACTIVITY THREE: Matching Game

A. Mammals of Alberta

(NOTE TO TEACHER:

The sketches and descriptions (Animals and Plants: Excerpt #9) can be put into card shapes and mounted on cardboard or laminated so that children can use them without any problems. The cards could be stored in an envelope at the centre).

Instructions:

Match the picture of the mammal with the description or story about each mammal. Once all the matches have been made, check your answers with a key from your teacher.

ANIMALS AND PLANTS:

ACTIVITY FOUR: Reading Booklets

A. How the Indians Used the Natural Resources of Plants and Animals

Instructions:

1. Read the Booklet "How the Indians Used the Natural Resources" (Animals and Plants: Excerpt #10).
2. Complete the activities in your scribbler.
3. Complete the Review Puzzle (check your answers).

ANIMALS AND PLANTS;

ACTIVITY FOUR: Reading Booklets

B. How the Early Settlers Used the Natural Resources of
Plants and AnimalsInstructions:

1. Read the Booklet "How the Early Settlers Used the Natural Resources of Plants and Animals" (Animals and Plants: Excerpt #11).
 2. Complete the activities in your scribbler.
 3. Complete the review exercises at the end.
-

ANIMALS AND PLANTS:

ACTIVITY FOUR: Reading Booklets

C. Wild Flowers of Alberta

Instructions:

1. Read the Booklet "Wild Flowers of Alberta" (Animals and Plants: Excerpt #12).
2. Complete the activities in your scribbler.

ANIMALS AND PLANTS:

ACTIVITY FOUR: Reading Booklets

D. Birds of Alberta

Instructions:

1. Read the Booklet "Birds of Alberta" (Animals and Plants: Excerpt #13).
2. Complete Activity A at the end and one of Activities B1, B2, or B3.
3. Complete the Review. Check your answers with your teacher.

ANIMALS AND PLANTS:

ACTIVITY FIVE; Experiments

A. Paper Quality

Paper companies produce different qualities of paper. The kind of paper they produce depends on the amount of strong and weak pulp used in the mixture. Excerpt #2 tells about making paper.

Instructions:

- 1. Look at different kinds of paper.
- 2. Tear some scraps of paper to test its strength.
- 3. Then copy and fill in the following table.

(Try to test all kinds of paper around home and your classroom).

KIND OF PAPER	MOSTLY STRONG PULP	MOSTLY WEAK PULP
Newspaper		
Expensive Writing Paper		
Shopping Bag		
Facial Tissue		

ANIMALS AND PLANTS:

ACTIVITY FIVE: Experiments

B. Value of Forest Cover in Soil Erosion

This is a useful device to show the effect of forest cover in holding moisture. It consists of two large mounds of earth which correspond to hills. These should be placed on a ridge outside where there is a slope. Make the piles of earth and with a stick scoop out a stream bed on each slope running down the valley. For each slope there may be constructed tiny paper houses, barns and bridges for the stream.

Now press moss firmly on to one hill including the banks of the stream bed. Put evergreen twigs into the moss to represent trees.

Hold a sprinkling can three feet from the hills. Let the "rain" fall on the forested hillside. The trees will break the fall of the drops and the moss will absorb most of it. When the uncovered hillside is watered the drops hit the ground with much force, form gullies and rush down the stream bed with great speed. The stream becomes muddy and overflows its banks. As a result the lower areas are flooded and the bridge will be washed away.

ANIMALS AND PLANTS:

ACTIVITY FIVE: Experiments

C. Plants Need Sunshine

Instructions:

Place a plant in a dark room or closet to black out all sunlight. Describe the plant carefully before you put it away. Leave the plant for 1 week to 10 days. Describe the plant when you take it out. What happened? Why?

PLANT	
Before	After

ANIMALS AND PLANTS:

ACTIVITY SIX: Making up Questions

A. Using Excerpts

Instructions:

1. Pick an excerpt (or two related excerpts).
2. Read it/them very carefully.
3. Make up 5 questions about the excerpt and write them on a sheet. Hand them in to your teacher or ask your friends to answer your questions.

ANIMALS AND PLANTS:

ACTIVITY SIX: Making up Questions

B. Using Other Resources

Instructions:

1. As you complete the different activities make up a set of 5 questions on a topic you are studying.
 2. Write the title, the name of the resource and the 5 questions on a card.
 3. Give them to a friend and have him/her answer the questions.
-

ANIMALS AND PLANTS:

ACTIVITY SEVEN: Expressive Activities

A. Writing Poetry

Instructions:

1. Write a poem (e.g. Haiku) about a flower, tree, animal or bird in Alberta.
2. Read your poem to your teacher or a friend.
3. Write the poem neatly on a sheet and post it on the bulletin board.

ANIMALS AND PLANTS:

ACTIVITY SEVEN: Expressive Activities

B. Writing Riddles

Instructions:

1. Write a riddle about a plant or animal in Alberta.
 2. Place your riddle on a card and place the answer on the back.
 3. Share it with a friend or your teacher.
-

ANIMALS AND PLANTS:

ACTIVITY SEVEN: Expressive Activities

C. Poster Centre

Instructions:

1. Design a poster which shows how you feel about the wildlife in Alberta.
2. Mount your poster on the classroom or school hallway bulletin board.

ANIMALS AND PLANTS:

ACTIVITY SEVEN: Expressive Activities

D. Creating a Collage

Instructions:

1. Collect pictures of Alberta's plants and animals and create a collage, poster or chart.
 2. Mount your collage on the classroom or school hallway bulletin board.
-

ANIMALS AND PLANTS:

ACTIVITY EIGHT: Concrete Activities

A. Field Trip

Take the class on a field trip to a zoo or game farm to observe animals at close range. Bird study at school can be promoted by field trips to see birds in their natural habitat.

ANIMALS AND PLANTS:

ACTIVITY EIGHT: Concrete Activities

B. Clubs

1. An Audubon Junior club may be formed in a school to promote bird study. The former Canadian Nature Magazine, now called Canadian Audubon, sponsors such clubs and information may be obtained from it regarding their formation. The aims and objectives of such clubs are quite worthwhile and helpful material is sent to the teacher to use in guiding the group.

2. Bird Watching Clubs

The Audubon Society encourages such clubs. The most successful program for classes is to choose one bird for study at a time. For instance the robin might be chosen. The objectives of studying the robin might be to recognize it by sight and sound and to learn to conserve robins in the vicinity of the school and the homes in the area, especially farm homes.

Learn to identify the bird through pictures, etc. Go on a field trip to see and study them in the spring time. Plan the trip in conjunction with another type of field trip in case no robins are located. Keep a list and details of chance encounters by individuals.

ANIMALS AND PLANTS:

ACTIVITY NINE: Reading a Map

A. Forest Resources

Instructions:

1. Study the map "Forest Resources" (Animals and Plants: Excerpt #14).
2. Answer the following questions in your scribbler.
 - (a) List the Forest Management Areas.
 - (b) Which area is the largest? the smallest?
 - (c) In which forest management areas are sawmills located?
 - (d) In which areas are pulpmills located?
 - (e) Which forest area is closest to your home?
 - (f) Why are Wood Buffalo, Banff and Jasper National Parks not used as forest areas?
 - (g) Which forest area has the most pulpmills? sawmills?

ANIMALS and PLANTS

Excerpts

THE IMPORTANCE OF PLANTS AND TREES

Without sunshine and plants, people and animals could not live on the earth. Leaves take carbon dioxide from the air and give off oxygen. The oxygen in the air helps human beings and animals breathe.

The leaf on a plant or tree is just like a factory. It is in the leaf where food is made from different elements, hydrogen and oxygen. From the soil it also absorbs minerals which are needed to make proteins. Inside the leaf, cells containing chlorophyll (the green colouring) make carbon dioxide and water carbohydrates. This change cannot happen unless the leaf or plant has sunlight. The sunlight shines through the clear skin of the leaf and causes a chemical change to take place. The carbon dioxide and water are changed into carbohydrates which are then changed into proteins which the tree or plant needs to live and grow. This chemical change is called photosynthesis. This process is one of the wonders of nature.

Trees and plants are very important to us. Leaves are the only living things that make food from elements in the air and soil. They are the only living things that make extra oxygen. We depend on plants for our food and air.

Trees also help prevent floods and minimize the effects of long dry spells. The roots help to hold soil and thus prevent soil erosion. The floor of the forest has a cover made up of leaves partly decayed and newly fallen which acts as a reservoir to hold water. The roots of trees open the ground and let the water in.

Animals and Plants: Excerpt #1

FORESTRY

Over two-thirds of Alberta is covered by forests. Alberta ranks fourth among Canadian provinces in the amount of timber produced and the total area of forests. The forest products industry earns millions of dollars for Albertans each year. Forest based industries earn approximately ten percent of the value of manufactured goods in Alberta.

There are two kinds of trees in Alberta forests. The CONIFEROUS forests consist of white spruce, black spruce, balsam fir, jack pine and lodgepole pine. The DECIDUOUS forest has poplar and aspen trees. White spruce are the most important trees in the forestry industry.

During the last twenty years forest production in Alberta has increased. In 1956 a large pulpmill was established at Hinton, Alberta. Another large pulpmill built by the Proctor and Gamble Company near Grande Prairie produces more than 750 tons of bleached pulp per day. A second mill built at Hinton in 1972 produces large quantities of building materials. The Simpson Timber Company at Whitecourt makes laminated beams which are used to build houses. The Alberta Aspen Board Company near Slave Lake produces hardwood wallboard.

Most of Alberta's forest industry is the pulpwood

operation. At a pulpmill the wood is made into PULP. Here is how it is done.

1. Chipping mills cut the wood into little chips.
2. The chips are cooled in chemicals and bleached. They turn into a kind of porridge. This is wet pulp.
3. The "porridge" is rolled out and dried. It becomes dry pulp.
4. The dry pulp is cut into convenient sizes for shipping. It is sent to paper companies all over the world.

The paper companies buy the dry pulp from the pulp mills and then make their own paper. Paper companies need different kinds of paper for different purposes. Some companies produce kleenex, or newspaper, or writing paper. The kind of paper that is produced depends on the amount of strong and weak pulp used in the pulp mixture.

The pulp produced at many mills is very strong pulp. When the paper companies get the dry pulp, they mix it with cheaper, weaker pulp. The kind of paper they get depends on the amounts of strong and weak pulp mixed together to make the paper. A larger quantity of strong pulp produces strong, good paper. A larger amount of weak pulp produces paper which tears very easily. Look at different kinds of paper. Is it made mostly out of weak pulp or strong pulp?

BENEFITS OF THE FOREST

Wood is one of the most commonly used materials in our lives today. We climb out of bed in the morning - it is probably a wooden bed - and eat breakfast at a table (maybe it is also wooden). Father reads the morning paper which is a product of wood and runs to catch the bus for work. He pays for his ticket with a one dollar bill which is also made out of wood.

Products made out of wood are all around us. Cereal packages, wrapping paper, cellophane, plastics, turpentine, safety glass windshields are all made out of wood. Our houses and apartments use wood to construct the frames and floors. Plywood is used to build walls. Companies use wood to make boxes and crates. Telephone poles, fence posts, railroad ties, and bridge timbers are produced from forests.

The graceful wooden arches seen in many of the new churches, auditoriums, ice rinks or community centres are now made in Alberta. The arches and beams are made up of hundreds of pieces of wood which have been pieced together and glued with special glues to form a structure of great strength.

TREES OF ALBERTA

A variety of trees grow in Alberta. Some parts of Alberta have very few trees. A number of trees will be described in the following excerpt.

Black Spruce

The Black Spruce is a hardy tree and one of the most northerly growing trees. It has thin bark with many scales. Cones are egg-shaped, grey-brown in color and stay on the trees for several years. The needles are bluish green in color and tipped with a sharp point. The wood is valuable for pulpwood.



White Spruce

This tree is one of the main species on the Eastern slopes of the Rockies. It grows best on moist, gravelly soil and can stand shade. The needles are blue-green with a pungent smell. The cones are pale green tinged with red and bend easily. The wood is light, soft and easily worked. It is often used for musical instruments because of its resonance qualities.



Adapted from The Alberta Story

Balsam Fir

This is a very common tree throughout Canada and Alberta. It can grow in various soils. The bark is reddish brown with many resin blisters. The needles are short and fragrant without sharp points. The cone is a greenish purple colour. It has a good general purpose wood. The blisters produce a balsam which is a sort of resin used to make varnish.



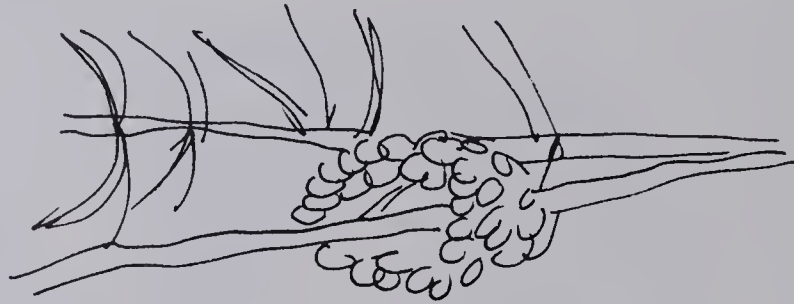
Eastern Larch (Tamarack)

The tree is a deciduous tree. The thin scalp bark is bright reddish brown; the light green needles grow in bunches. The cones are very small. The Eastern Larch is the source of very durable hardwood used for bridge timber, telegraph poles and railway ties.



Jack Pine

This tree likes plenty of light and grows in sandy or rocky soil. A great number of Jack Pine grow west of Edmonton. The needles grow in bunches of two in a sparse and scrubby way. They are a dark yellow-green in colour. The cones are roasted in the heat, the scales open and the seeds fall out. The wood is used to produce a good grade of lumber useful in building houses.



Aspen

The aspen grows in all parts of Canada. The smooth, thin, white bark of the young trees becomes ridged and darker coloured over the years. Leaves are round with pointed tips and hang on long stalks. The aspen is the beaver's favorite food. In Alberta it is used a great deal for firewood in fireplaces.



White Birch

The white birch is widely distributed within the Boreal Forest Region and grows further north than any other broad leafed tree. It requires a considerable amount of light, and in Alberta reaches a height of about 20'. The bark is smooth and peels into papery thin layers, creamy white on the outside. The oval leaves have serrated edges, are alternate and about 2½" long; they are somewhat sticky underneath. The slender catkins are greenish with some red, and the fruit is a small two-winged nut in a cone-like body from which the scales fall away, thus releasing the nut. The white birch is often found in large stands after a forest fire, as it thrives in the light. It is a medium hard wood and is especially suitable for small-turned articles. The Indians used the bark for their canoes, the inner bark is enjoyed by the beaver, and moose and deer eat the twigs in winter.



Balsam Poplar (Balm of Gilead)

This tree is found throughout the Boreal Forest Region and is most common on rich moist soil such as on the banks of streams or sandbars. In Alberta it reaches a height of about 50' to 60'. The bark is light brown but turns grey in old age. Winter buds are soaked in a fragrant gum and at first the leaves are gummy too; they are 3" to 5" long and are oval to heart-shaped. Like many other poplars, the Balm of Gilead acts as nurse tree for spruce seedlings. The quick growing wood is almost ideal for pulp, especially in the manufacture of magazine stock. Many boxes and crates are also made from it.



Lodgepole Pine

This tree grows in the mountains. It is the main tree in Jasper and Banff. It grows very slowly. The dark green needles grow in bundles of two and are rather twisted. The cones release their seeds with the heat of a forest fire and so most of the trees are at the same height having started to grow at the same time. The Indians, early settlers and modern lumbermen use the trees for poles.



CONSERVING OUR FORESTS

When Alberta first became a province its natural resources were managed by the federal government. In those days the government was wise and set aside large areas of forest lands for parks and recreation. It also established timber reserves.

In 1930 the government of Alberta took responsibility for its natural resources. It introduced a timber quota system. This system permits the cutting of trees for five year periods, while keeping a balance between forest growth and forest use. All the companies producing forest products are allowed to cut only a certain amount of trees each year.

The forests in Alberta have been divided into ten areas or units. The government of Alberta owns all the forests and leases or gives licenses to certain companies to operate forestry operations in each unit. Specialists keep watch over each unit to make sure that companies keep the quota limits and that reforestation is followed to ensure a plentiful supply of timber in the future.

Reforestation is carried out each year. The planting beds are prepared by bulldozers scarifying the area. This means that bulldozers clear the bush and debris and scatter it on the surface. The beds are then planted with seeds. Sometimes small trees or seedlings are planted. The

Provincial Agricultural Tree Nursery near Edmonton supplies many of the seedlings used in the reforestation work.

The Alberta government also has a Forestry Training School at Hinton where forest protection and conservation are taught to forest officers, lookout tower men and other interested persons. Various persons are selected by officials to become key fire fighters. They receive special training and are certified as "Fire Bosses". Junior Forest Warden clubs teach boys and girls the need for proper methods and procedures of conservation.

Animals and Plants: Excerpt #5

THE FOREST RANGER AND FARMER WORK TOGETHER

There is a very close relationship between a forest ranger watching his trees and a farmer who looks proudly at his field of grain growing on his irrigated land. There is a close connection because the forests in Alberta forest reserves have made irrigation and the growing of better crops possible in Southern Alberta.

The forests serve a very useful purpose. Forests hold the snow and keep it from melting too quickly in the spring. By the time the sun's rays grow warm enough to melt the snow underneath the tree branches, the spring run-off is past. During the summer months the forests store water and keep the streams running. The streams flow into one another and become rivers. The rivers hold major hydro-electric dams and are very important for the irrigation of fields.

Irrigation is very important to farmers in southern Alberta. This area is covered with a system of canals, ditches and pipes which carry the crop-giving water to the new irrigated farms. Giant irrigation dams such as the Bassano Dam store lakes of water for the farmer's use.

In the irrigated areas there are four main types of farms: grain, livestock, specialty crops and mixed farming. Sugar beets are produced at Raymond, Picture Butte and Taber. Canning crops are grown around Lethbridge, Taber

and Brooks. Alfalfa seed production is a specialty at Brooks. Some wheat farming and mixed farming is carried out in some districts. Livestock is raised throughout the irrigated areas with large numbers of cattle and sheep brought in for feeding.

Yes, both the forest ranger and farmer are interested in preserving the forests of Alberta. Every Albertan should work to keep Alberta forests green.

Animals and Plants: Excerpt #6

MAMMALS OF ALBERTA

Mammal life has changed during the time since the Indians and early settlers have lived in Alberta. The buffalo have disappeared except for those in the parks; antelope are increasing; elk are to be found in the mountains and marten and fisher are becoming rare.

The government has passed laws regarding the hunting and trapping of animals. Some animals are in danger of extinction and need to be preserved. Other animals need to be controlled; some are of value for sport and others for trapping. Hunting seasons are carefully controlled; only certain animals and times are permitted for the hunter to use.

People sometimes upset the balance of nature when they kill too many animals of one kind. Other times the government protects animals with strict hunting laws or game sanctuaries. When an animal becomes scarce then the animals that prey upon it also become scarce. For example, a decline in snowshoe rabbits is followed by a drop in the number of coyotes.

GAME PRESERVES AND BIRD SANCTUARIES

It is a law in Canada and Alberta that wild animals must be protected. The Government has set aside certain areas where no shooting or hunting is permitted. Besides the national parks, there are a number of other preserves for wild animals.

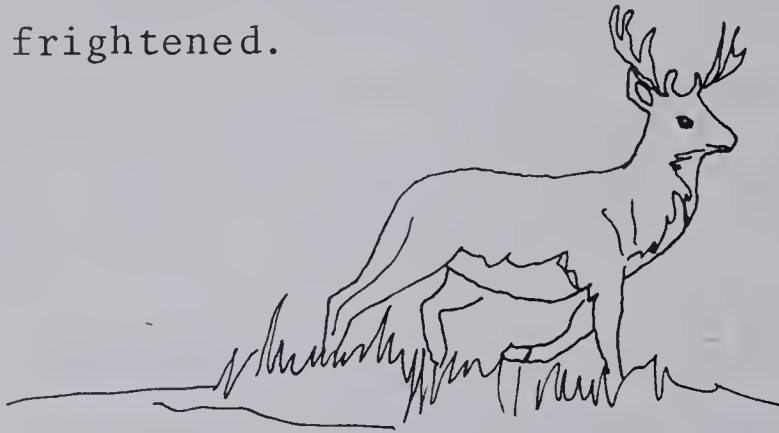
Near Edmonton is the Elk Island National Park which keeps a herd of buffalo. The area is fenced and also has elk, moose and deer. The far north-east part of Alberta is Wood Buffalo Park. It is a place where buffalo are kept. In the southern part of the province is Nemiscan Park. This is a small park where prong-horned antelope are protected.

Birds are also protected in the national parks. Several Bird Sanctuaries have been established in Alberta. At these places birds can nest and live unharmed. Hunters are not permitted to shoot or molest the birds.

MAMMALS OF ALBERTA

Mule Deer

This deer has its name because of its large ears. It's coat is dark grey in winter and yellowish brown in summer. The tail is white with a black tip. Many mule deer spend the summer months quite high on the mountain slopes and descend to the valleys in the winter. Mule deer are sometimes called jumpers because they leap straight into the air when they are frightened.

Moose

This animal is easy to recognize because of its broad big antlers. It has a large head with a muzzle, humped shoulders and below the throat is a flap of skin called a throat bell. The upper part of the moose is dark brown and the underneath grey. In summer it feeds on water plants and in winter on twigs and bark. Sometimes a large moose will weigh as much as one ton.



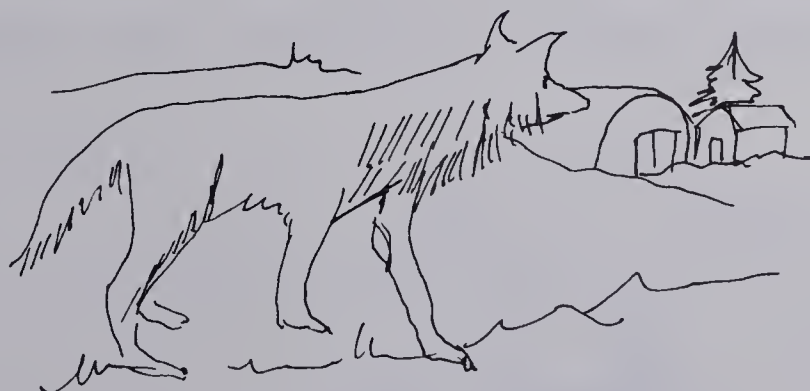
Porcupine

The porcupine has a small head, a heavy short tail and a body covered with quills. The quills are attached to a layer of muscle next to the skin. The long quills do no harm but the shorter quills are barbed and stick into the flesh of enemies sometimes causing them to die. A porcupine does not throw its quills. The porcupine lives in a hollow tree or a hole in the ground and comes out from time to time to look for roots and bark. His meat is tasty so laws protect him.



Coyote

This prairie wolf is found in the prairies and in the mountains. The fur is thick and warm. The coyote hunts mostly at night and eats gophers, poultry, birds. They usually hunt in packs. Everybody remembers the coyote for his mournful and melancholy howl late at night.

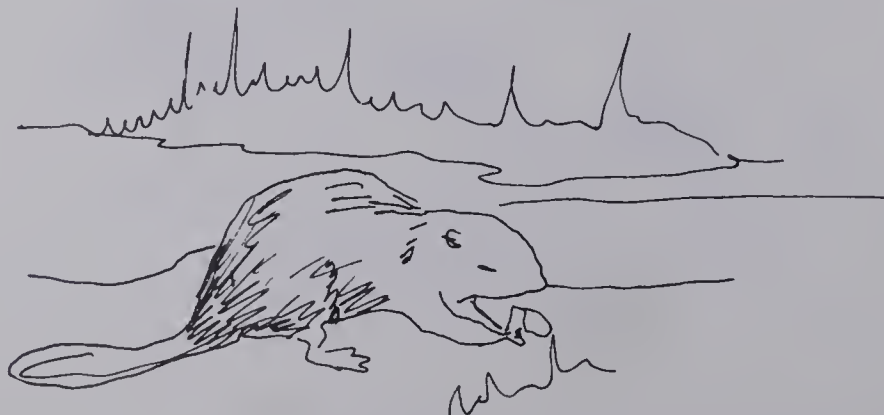


Muskrat

This furred animal with its small ears and eyes and short legs is much hunted for its fur. The waterproof fur is brown, the feet are partly webbed and the tail is hairless. The muskrat lives in burrows in the banks of streams or lakes just above the water or in stick houses in the water. It does not hibernate in winter.

Beaver

The Beaver's pelt brought the fur trader to Alberta. The beaver has a heavy body, short legs, webbed feet and a flat tail. They build dams and cut down trees with their sharp teeth. The beaver lives in a lodge in his beaver pond. In summer he eats water plants and in winter he lives on twigs, bark and leaves stored in his lodge. The beaver does not hibernate.



Black Bear

The Black Bear is found in the forest regions. It may be any colour from black to cinnamon. Bears eat almost anything - roots, berries, mice, insects, and wild honey. In winter bears hibernate and it is during this time that the cubs are born.



Gopher

The name gopher comes from the French word for honeycomb (gaufre) because of the way the animal digs and burrows tunnels in all directions under the surface of the ground. The gopher has pockets or pouches in his cheeks which the animal uses for carrying food. It eats grass, roots, buds, vegetables and stores the rest for winter. It digs its burrows with the claws of the front feet and four large front teeth. Gophers destroy some crops and dig a maze of tunnels.



Jack Rabbit

This animal is really a hare and not a rabbit. A hare has longer ears than a rabbit and does not dig a burrow but sleeps in hollows on top of the ground. Its brown coat turns white in winter for protection from its enemies. The Jack Rabbit eats all kinds of plants, leaves and seeds. It is one of the fastest moving small animals.



HOW THE INDIANS USED THE
NATURAL RESOURCES OF PLANTS
AND ANIMALS

HOW THE INDIANS USED THEIR NATURAL RESOURCES:

PLANTS AND ANIMALS

The early Indians lived very close to nature. They held great respect for the environment around them. To the Indians every form of life, including the plants and animals was part of their lives.

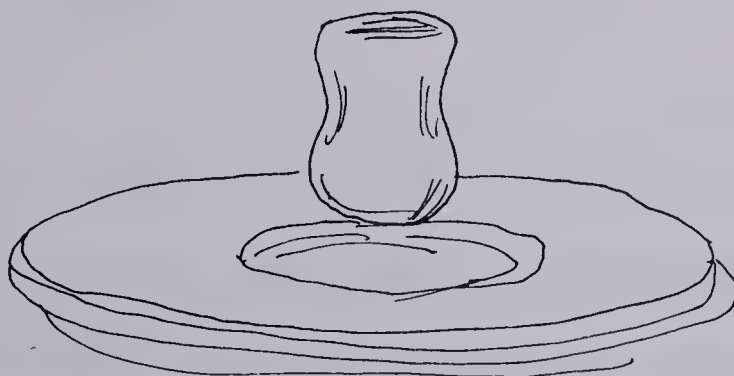


FOOD

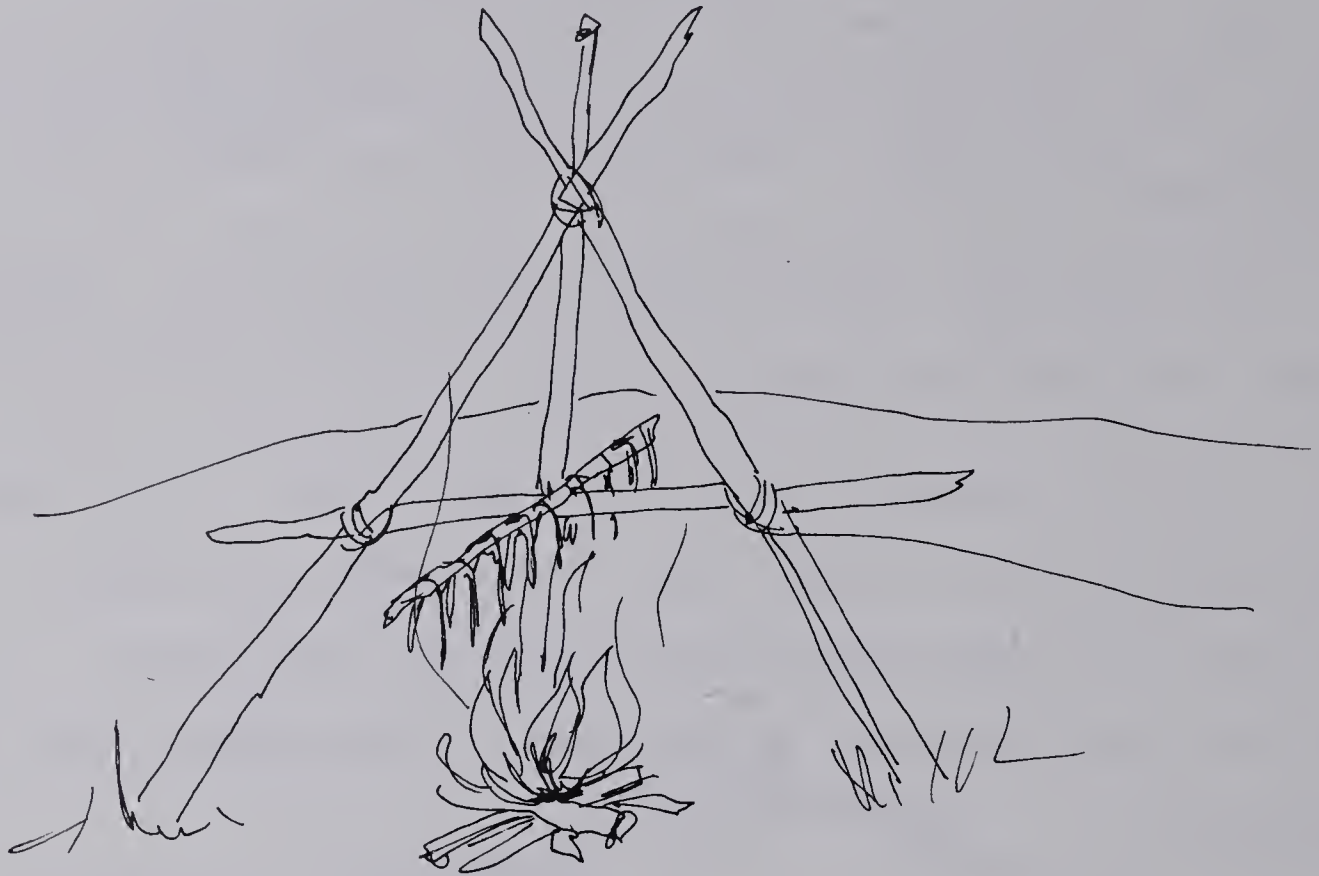
The buffalo provided the Indians with their main source of food. When the hunt was offered, a great feast was held. The best meat was given to the old people, the orphans and widows.

The meat was cut and hung in the sun to dry. When it was ready, the meat was stored in bags or containers made of skin.

Some of the dried meat was laid on flat or hollowed rock and pounded with a round rock. This tool was called a maul. The meat was then mixed with animal fat and berries. The mixture would keep for a long time. This mixture was called pemmican.



The meat was also roasted over an open wood fed fire. A tripod was set over the fire. The meat hung from the tripod above a fire and roasted.



A. Things to do:

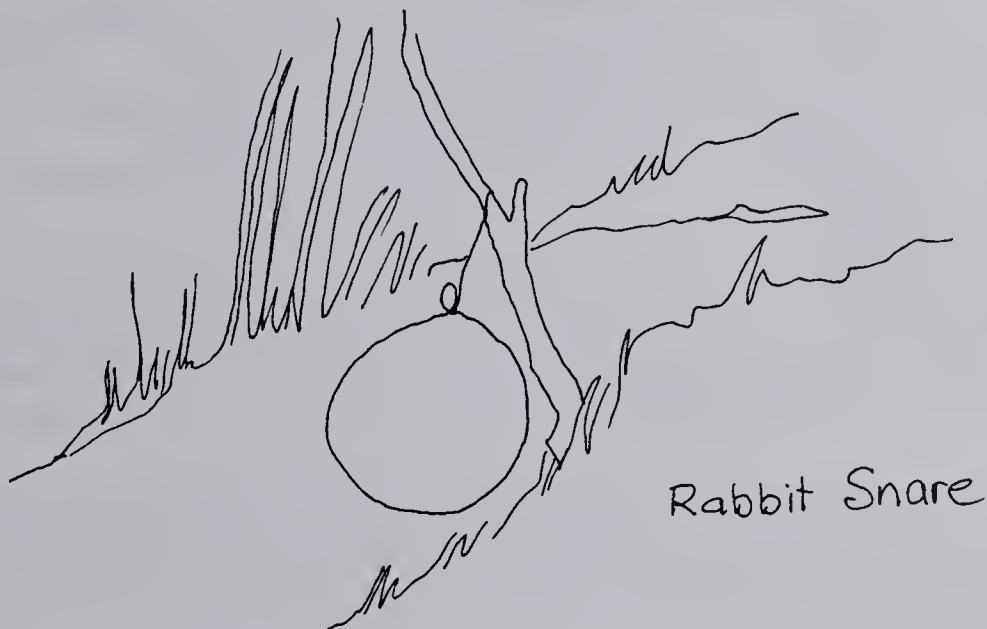
Instructions:

Pretend you belong to an Indian family. Tell how you would prepare the supper meal. What would you eat? How would you cook your food? Why would you give your best food to an old person or an orphan?

Write your story in your scribbler and be prepared to read it to your class.

The Indians used various plants in their environment for food. Berries, wild turnips, roots and herbs were gathered by women and children. The berries were dried and stored in skin containers. Some berries were crushed and mixed into the pemmican. Wild turnips were peeled, dried, pounded into a powder and used as thickening for soups. Herbs and roots were used to season the food and make it tasty.

Indians didn't eat buffalo meat all the time. They also ate other game and fowl such as antelope, deer, rabbits, prairie chickens, ducks, geese and occasionally fish.



B. Things to do:

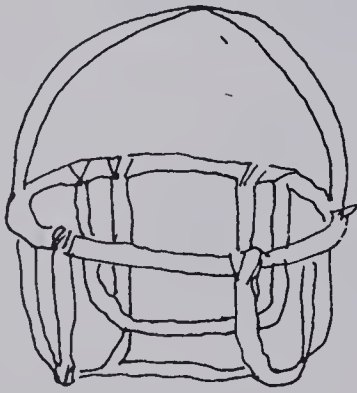
Instructions:

1. Answer the questions in complete sentences in your scribbler.
 - (a) What is a snare? How does it work?
 - (b) How would Indians hunt deer and antelope?
 - (c) What are herbs? (Use a dictionary).

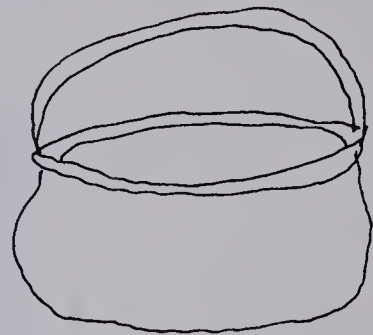
- (d) Why did the Indians eat only wild plants?
Why were there no gardens?
- (e) Do you think the Indians had a healthy diet?
Why or why not?
- (f) Why didn't the Indians eat bananas and some
other foods we eat today?

STORAGE AND TOOLS

The Indians stored food, clothing and other items in containers and bags made from the hides of buffalo and other animals. Animal hides were cut and sewn into the shape of bags or pots and left to dry.



Frame for a Cooking Pot



Skin Cooking Pot

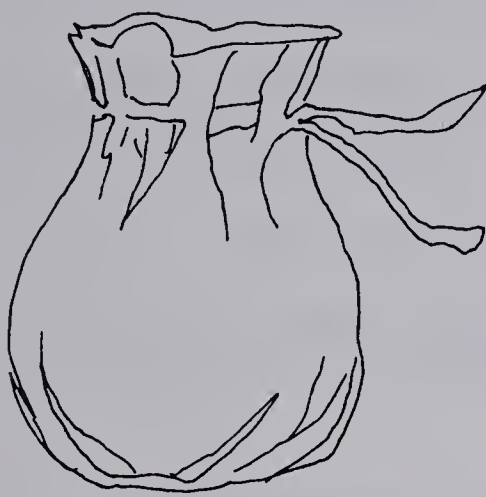
C. Things to do:

Instructions:

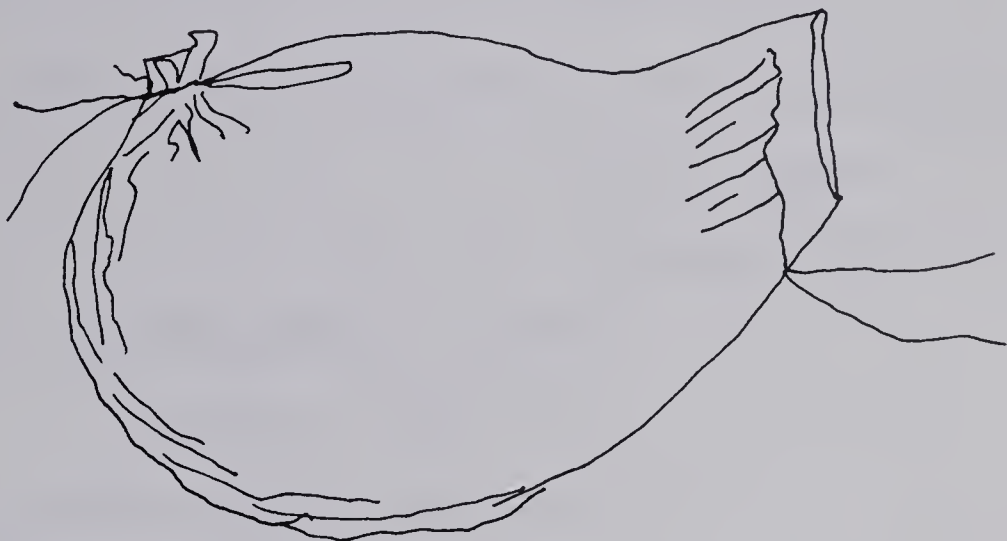
1. Answer each question in a sentence:

- (a) The frame is made out of willow twigs. How do you think they were shaped to form a container?
- (b) What happens to leather when it dried?
- (c) Why did leather make a good cooking pot?

The Indians traveled very often. They had to take along a food supply wherever they went. Berries and dried meat were often stored in skin pouches or animal stomachs.



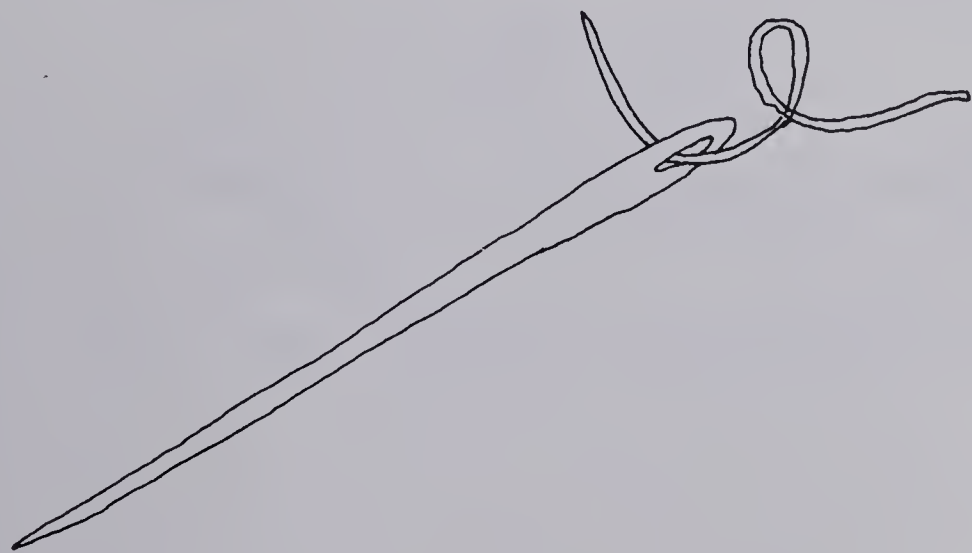
Storage pouch made out of animal skins



A storage bag made of an animal stomach

Some of these pouches were airtight and were excellent to store all kinds of food, medicines and other things.

Needles were carved from slivers of bone or horn. The sliver was smoothed and shaped to a fine point and a hole was drilled at the end for the thread sinew.



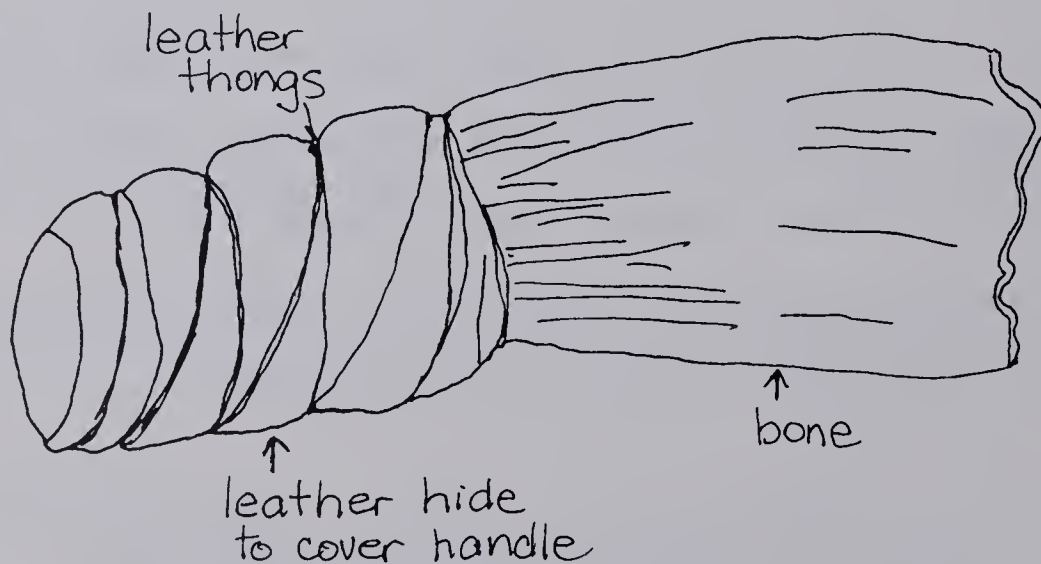
The Indians used sinew as thread. Sinew is the back muscle of an animal (deer or buffalo). It is long and stringy and very strong. The Indians dried the muscle, separated it into strands and then used it as thread or sewing string. Sinew is so useful that it is still used by some craftsmen today.

D. Things to do:

Instructions:

1. Answer the questions in complete sentences.

- (a) What is sinew?
- (b) What did the Indian use for needles?
- (c) Why didn't Indians use sewing thread?
- (d) Why is sinew still used today?

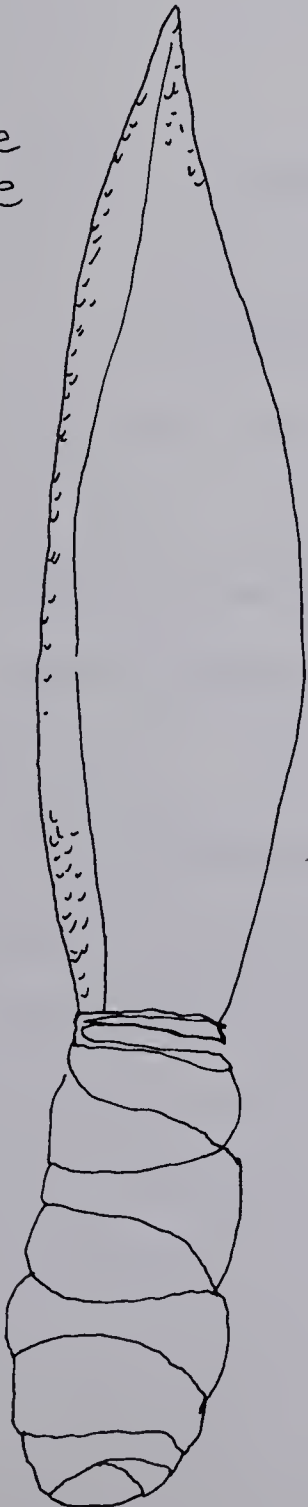


This is a picture of a scraper or flesher. The scraper was made from the thigh or leg bones of animals. How would the Indians use a scraper? The scraper was used

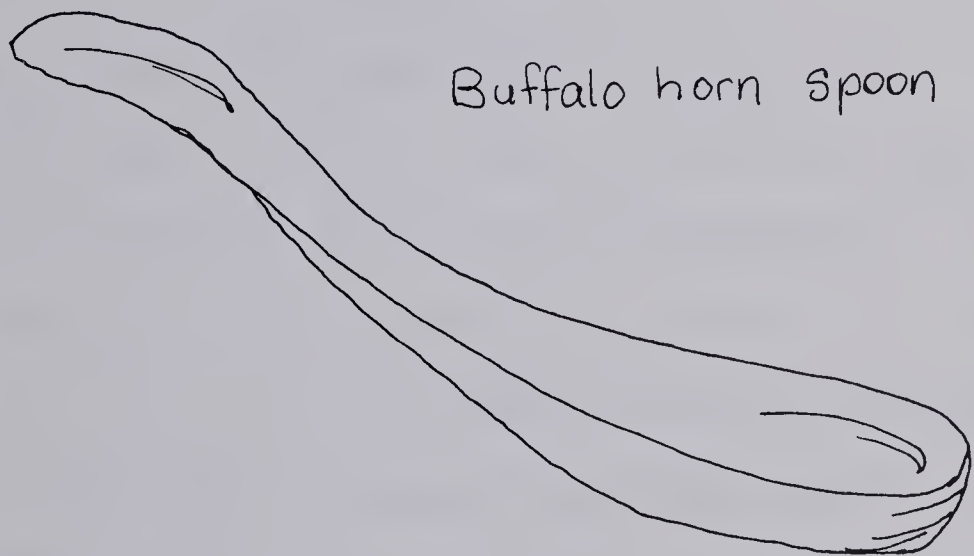
to scrape meat and fat off the hides. Once the hides were clean, they were dried and tanned.

The Indians used bone and wood to fashion their basic tools. A knife was carved from the rib of an animal and sometimes the blade was made from flint tied to the bone handle with leather thongs. Spoons were made from bones or horns of animals. Special eating bowls were made from wood. The wooden dishes were very valuable to the Alberta Indians.

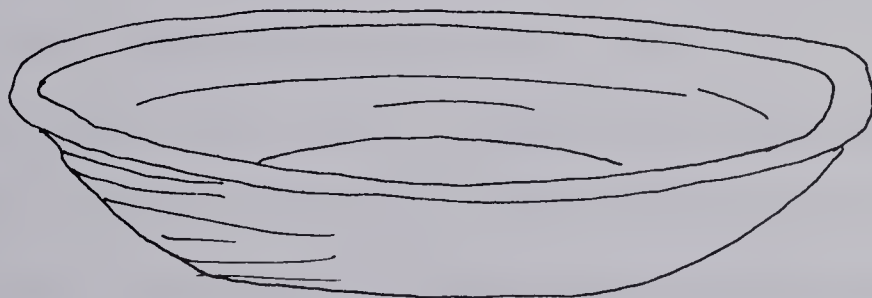
Bone
knife



Buffalo horn spoon



Wooden eating bowl



E. Things to do:Instructions:

1. Answer the questions in sentences.

- (a) Why were the wooden bowls so valuable?
(Clue: Does Alberta have many trees?)
- (b) Why are ribs a good shape to be used in the making of knives?
- (c) What is flint? Use your dictionary to find the answer.
- (d) Do you think the Indians had many extra pots, knives or spoons that weren't always in use? Explain your answer.

CLOTHING

Clothing was made from the hides of animals. It was a long, hard process to make a shirt, leggings or dress.

Step One - The buffalo or deer was killed and slaughtered.

Step Two - The fresh wet hide or skin was pegged and stretched to the ground or on a rack.

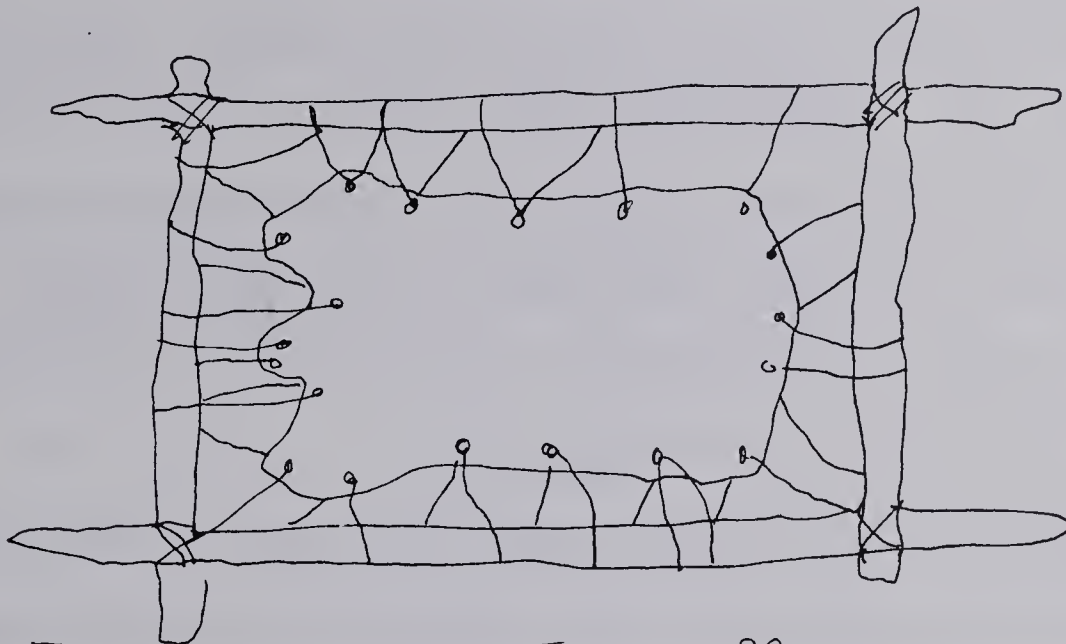
Step Three - The skin was scraped clean of fat and meat with a flesher or scarper. The skin was then soaked in water for three days.

Step Four - The skin was stretched again and the last of the hair and meat was scraped off. The skin was allowed to dry.

Step Five - The dried hide was now rubbed with a mixture of sand and animal brains and again left to dry.

Step Six - The hide was rubbed together by hand to make the leather soft and pliable.

Step Seven - The hide was then stretched on a tanning frame to tan it a light brown colour or dyed with natural dyes.



Tanning Frame For Buffalo Hide

Step Eight - The hide was cut into shapes to make the dress, leggings, shirt, moccasins or robe the Indian needed. A bone or flint knife was used to cut the shapes.

Step Nine - The pieces of hide were sewn together with sinew. The Indians used a bone needle.

Step Ten - The clothing was decorated with porcupine quills, horse hair, shells, claws, feathers, and hooves. If the Indians wished to dye the skins or decorate them, they used crushed berries, powdered coal, iron ore and other minerals to obtain green, blue, yellow and orange dyes.

F. Things to do:Instructions:

1. Complete the following activities.

- (a) Find a reference book or encyclopædia which tells about Indian clothing. Copy an Indian design used to decorate a dress, robe or moccasins.
- (b) Pretend you are an Indian. Design a dress, leggings or moccasins. What colours would you use?
- (c) Find out about "Indian beads". What are they? Where did they come from? Who used them? How were they used? Write a paragraph and post it on the bulletin board.

SHELTER

Shelter was provided from the natural resources in the environment of the Indians. The Indians lived in teepees, conical shaped tents, covered with buffalo hide. To build a teepee, the following steps were followed:

Step One - Three poles were tied together with leather thongs.

Step Two - The three poles were raised to make a tripod. The

leather thongs which tied the poles together were left long enough to reach the ground and were tied to stakes pounded in the ground to give support. (Remember the tent ropes you tie to the stakes when you set up your tent on a camping trip?)

Step Three - Next, 13 or more poles were leaned around the tripod to make the frame of the tent.

Step Four - Buffalo skins which had been sewn together with sinew were then placed over the framework of poles.

Step Five - The leather cover was tightly drawn around the poles and pinned together with wooden pegs. The opening or door faced east to greet the new day.

Step Six - The inside of the tent was carefully prepared. A fireplace was located in the centre of the teepee with a hole at the top for a chimney. Buffalo robes and hides were scattered around the floor as rugs and sleeping bags. Bags, containers, and storage utensils were set around the outer walls.

Step Seven - The outside of the teepee was painted by the man of the family with symbols and designs. In front of the door of his teepee he set out a stake or pole from which he hung the medicine which protected him and his family.

G. Things to do:

Instructions:

Use an encyclopædia or reference book which tells about Indians to find out:

- (a) What different symbols and designs Indians painted on their tents? Copy one and colour it.

- (b) Why Indian teepees were set in a circle.
- (c) What other shelter besides teepees were used by Indians. (Did they live in tents in the winter?)
- (d) How the medicine was supposed to protect the family living in the teepee.

TRANSPORTATION

Transportation was very important to Indians because they travelled almost constantly to follow the buffalo and find a good place to camp for winter.

In the early days the Indians walked long distances carrying heavy loads on their backs. Later, dogs were trained to pull a TRAVOIS which consisted of two poles tied together at the top with rawhide and attached to the dog's shoulders. The other ends of the poles dragged on the ground behind the dog. Farther down, behind the tail of the dog, a rawhide net or frame was fastened between the two poles. The loads were tied to this net and dragged along above the ground between the two poles.

Years later, the Indians trained horses to pull larger travois. Now heavier loads could be moved. In this way, meat, firewood, tools, cooking pots and small children were moved from place to place. A travois ride was a very bumpy, rough ride. The poles dragged and bumped along the ground behind the horse. We should remember that the

Indians never used wheels which may have helped to make a faster, smoother ride.

H. Things to do:

Instructions:

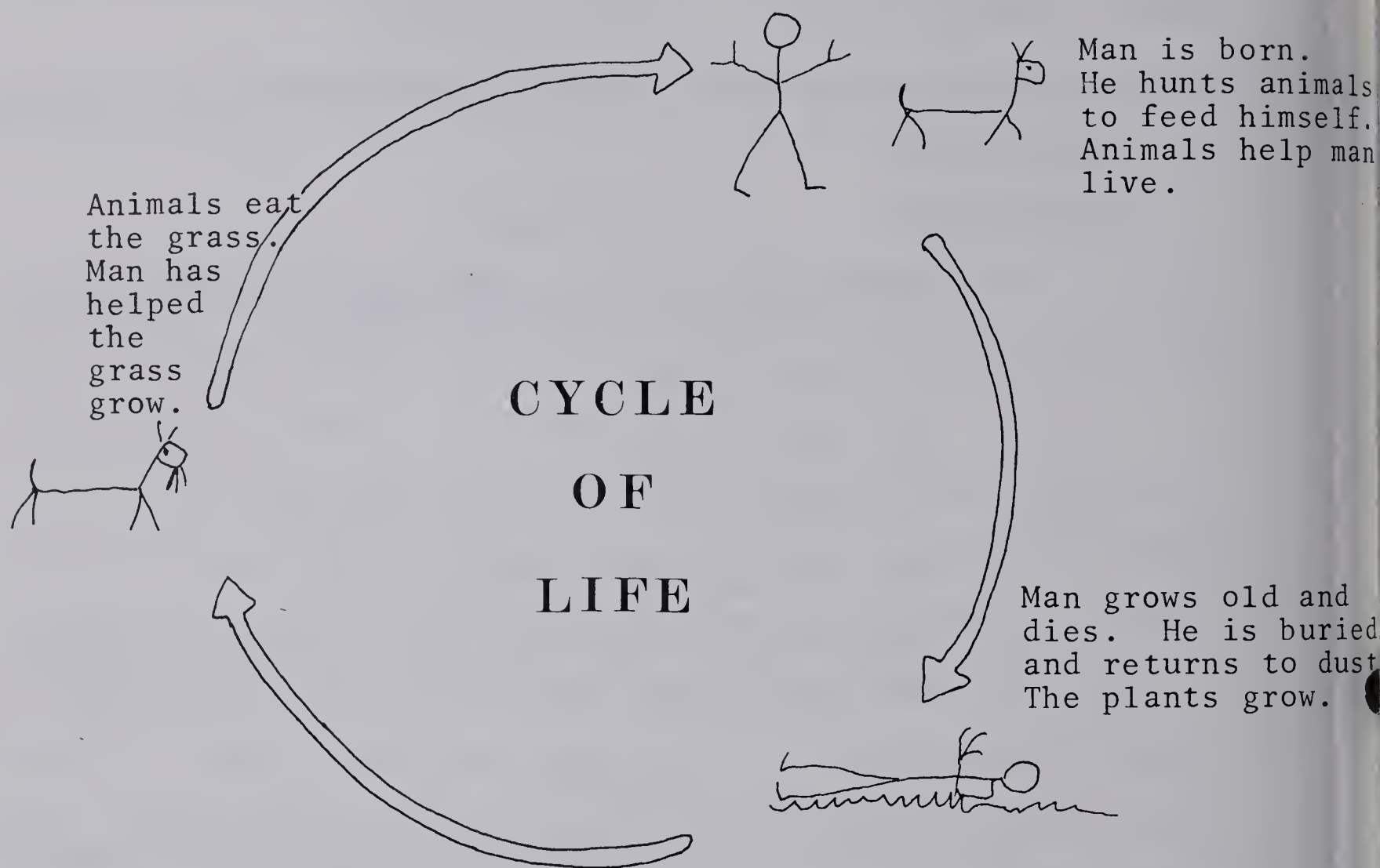
1. Draw a picture of a horse travois. Include the following parts and label them.
 - (a) two poles
 - (b) the horse
 - (c) rawhide net between the poles
 - (d) the load of household tools
2. Under the picture write one sentence about how the travois was used.

BELIEFS

Beliefs were very important to early Alberta Indians. The Plains Indians believed in the Great Spirit who had created all things. They also believed that all living things had a soul and so humans, animals, birds, fishes and plants were treated with respect and care. The earth was thought of as the mother of all living things and the sun, moon and stars were respected. The Indian believed that all things lived in a cycle of birth, life and death.

To be a good Indian meant to be humble, brave and gentle. But most important, an Indian was expected to deal

wisely with antural resources. The Indians did not fear death because they viewed death as part of the Cycle of Life.



I. Things to do:

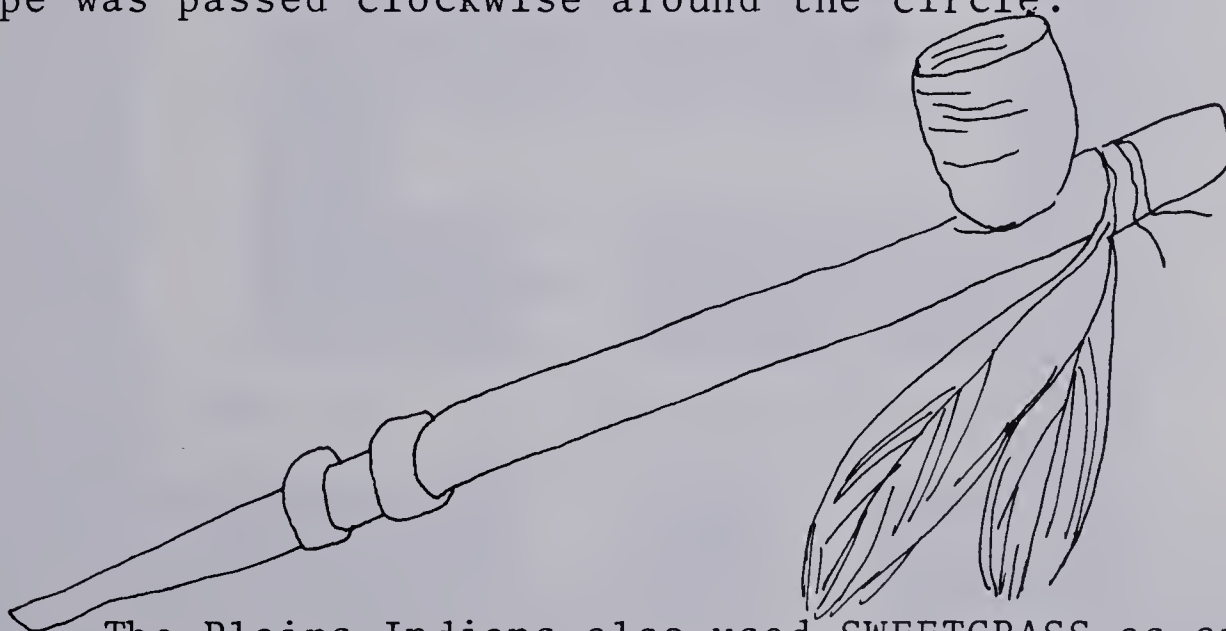
Instructions:

1. Write a paragraph explaining the Cycle of Life.
(Be sure to explain how death can be part of life.)
2. Illustrate your own Cycle of Life.

CEREMONIES

Ceremonies marked many important occasions in the lives of the Alberta Indians. Celebrations were held at Thanksgiving, the annual Pow-Wow, at the birth and death of family members and many other occasions.

Tobacco smoking was a special ritual at the ceremonies. Early smoking mixture was made from willow bark. The men (only men were allowed participate) sat in a circle for the smoking ceremony. A pipe was lit by the leader. Before he took a puff, he pointed the pipe north and up to show respect to the Great Spirit and then to the four directions of north, east, south and west. He would then take a puff and pass the pipe on to the person on his left. The pipe was passed clockwise around the circle.



The Plains Indians also used SWEETGRASS as an incense at various ceremonies. Sweetgrass is a fragrant smelling grass which grows in special places. The blades of

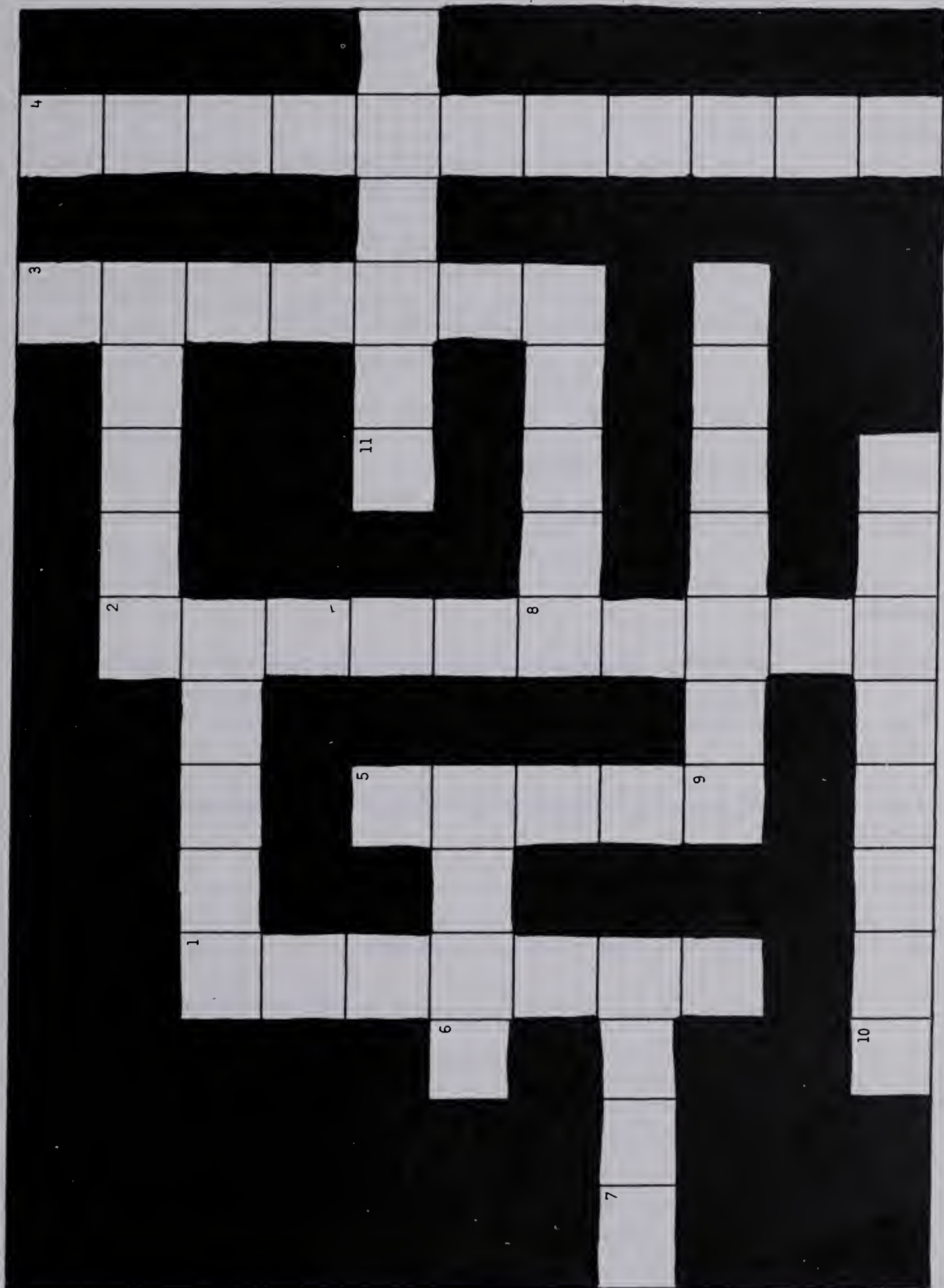
the grass are purple-pink in colour and when braided and burned, give off a heavy fragrance. To make the sweetgrass incense, the Indian braided the freshly picked grass into 30 to 60 centimetre lengths of rope. He would light the grass rope, hold his hands over the smoke and rub his body and hair with his hands. Then he would sit back and let the fragrance fill the air as he meditated. Everyone carried sweetgrass with him at all times.

J. Things to do:

Instructions:

Compare Thanksgiving at your home with that of the early Alberta Indian. You can do this in a paragraph, by drawing a picture, or by completing a chart similar to the one below. Complete your work in your scribbler.

	THANKSGIVING	
	INDIANS LONG AGO	MY FAMILY
RITUAL		
FOODS		



Down

1. A tool made from leg bones of animals and used to scrape meat and fat off hides.
2. Indian incense.
3. An attitude toward plants and animals held by Indians.
4. The Indians believed that all living things lived in a circle of birth, life and death called the ____ _ .
5. A rock used to make the blade of a knife.

Across

1. What Indians use for thread.
2. Tool used to catch small animals like rabbits.
6. A flat rock pounded by a round rock and used to crush food.
7. Material to make needles, knives or spoons.
8. The Indians believed the _____ spirit had created all things.
9. Used by Indians to transport loads and pulled by dogs or horses.
10. An Indian "shoe".
11. An Indian house made out of skins.

ANSWER KEY

A. p. 348 ANSWERS WILL VARY

B. p. 349-350

- (a) A snare is a leather thong, a string or wire hung in a loop at a place where animals run. When the animal gets caught and struggles the snare pulls tight and holds the animal fast or may even kill the animal.
- (b) Indian hunt deer with bow and arrow - later with guns.
- (c) Herbs are (DICTIONARY MAY VARY).
- (d) Indians moved about and did not plant gardens. They ate wild plants and fruits.
- (e) If balanced should be as healthy as our diet.
- (f) These foods not available to Indians.

C. p. 350

- (a) The frame was shaped by heating the twigs and bending them into the desired shape or green, supple sapling were used.
- (b) Leather shrinks and hardens when it dries.
- (c) Leather pots were waterproof, light to carry.

D. p. 352

- (a) Sinew is the back muscle of an animal used as string or thread in sewing.
- (b) Needles were carved from slivers of bone or horn.
- (c) Indians didn't have sewing thread.
- (d) Sinew still used because it is long and strong.

E. p. 354

- (a) Wooden bowls were valuable because hard to get -scarcity of wood-; easy to clean and light to carry.
- (b) Ribs have a shape similar to a knife and need little shaping before they can be used as a knife.

(c) Flint is (USE DICTIONARY).

(d) ANSWERS WILL VARY

F. p. 356 ANSWERS WILL VARY

G. p. 357-358 ANSWERS VARY ACCORDING TO REFERENCE BOOK(S) USED.

H. p. 359 ANSWERS WILL VARY

I. p. 360

1. The cycle of life includes birth, life and death. Each part leads to the next and is needed before the next can happen. Without death (seed into the ground or man changing to dust) there cannot be birth.

2. ANSWERS WILL VARY

J. p. 362 ANSWERS WILL VARY

K. p. 363

Answers to puzzle on the next page.



HOW THE EARLY SETTLERS USED
THE NATURAL RESOURCES OF
PLANTS AND ANIMALS

RESOURCES

The early settlers found life very hard. They had to adapt to new environment. As they built their homes and planted crops on their homesteads they had to learn to prepare and eat new kinds of foods. Pioneers got their food by hunting, picking berries and gathering plants which grew wild, by trading and buying with other people, and years later buying certain foods in town.

OBTAINING AND PREPARING FOOD

Many wild animals and birds roamed near the places where the early settlers homesteaded. The early settlers learned to hunt and cook many of these animals for food.

READ THE FOLLOWING STORIES:

HUNTING

A. "A large slough that lay about half a mile from the house attracted hundreds of ducks, and it was there that my brother loved to go shooting, taking along an old muzzle-loader that father had brought from the Old Country. He was only a lad at the time, not more than ten or eleven when the family first came to the homestead, and the gun that he carried was as tall as himself. Mother could hear the shots

ring out during the afternoon as the hunt went on, and toward supper-time the young hunter would return, weighed down by the birds that hung from the belt at his waist.

Threshing was slow work in those days, as it was done by horsepower and there was only one threshing-machine in the district. While it slowly made the rounds of the settlement, the grain often stood in the stack for weeks, waiting to be threshed. These stacks of wheat and oats made excellent feeding-grounds for the prairie-chickens, and in the early morning hundreds of the birds could be seen congregated about them.

Muzzle-loader in hand, father would sneak quietly up on the busily-feeding marauders and fire quickly into their midst before they could fly away. The excited children watched from the bedroom window and cheered lustily as he gathered up the dead birds and brought them to the house." (Robertson, Heather. Salt of the Earth, p. 62)

INDIAN RECIPES

A few of the early settlers learned how to cook certain foods from the Indians. One book of Indian recipes had directions for pickled beaver tail, moose nose, baked skunk, and bear fat pastry for pies! In a bad year gopher stew became the most important recipe.

RABBITS

B. "The rabbits sat around the haystacks by the dozens. If the doors were open they often ran into the house, especially if the dogs chased them. They were so frightened they didn't know where to go. One of our main dishes was rabbits. There was fried rabbit, stewed rabbit, rabbit ground into hamburger, smoked rabbit and rabbit everywhere, winter or summer." (Robertson, Salt of the Earth, p. 62)

"The early settlers endured many hardships. Food was often scarce, but they were thankful that no one had to go hungry while the supply of rabbits remained bountiful. No doubt rabbit for breakfast, dinner and supper became a tiresome menu, but no one complained and often they sang this song:

Rabbits young, rabbits old, rabbits hot, rabbits
cold,

Rabbits tender, rabbits tough, thank you, sir,

We've had enough."

(Scarrow and Gibson, Indians of Canada and Prairie Pioneers, p. 130)

FISHING

Early settlers sometimes wished for a change in diet. Some of the settlers were fortunate to live near a river or a lake. In the rivers and lakes swam pike,

pickerel, trout, whitefish, perch and tullibee. The pioneers quickly learned the best ways of cooking each type of fish.

A. Things to do:

Instructions:

1. Answer in complete sentences.
 - (a) If settlers had a gun, what wild animals could they shoot for food?
 - (b) If a settler had no gun, how could he supply meat for his family?
2. Use an encyclopædia to look up information about gophers. Write down 3 facts about gophers.
3. Design a trap for a gopher. Draw your model and show it to your teacher.

READ THE FOLLOWING STORIES:

FARM ANIMALS

The early settlers also kept animals on their farms. Pork was an important food. Sometimes the settlers would kill an old cow or sheep and eat the tough meat. They also ate chickens, ducks, geese and turkeys.

There were several ways of cooking food. The simplest way was on a spit over a fire or in a fireplace. Meat was also fried, used in stews, and put into meat pies. Some of the early settlers dried, salted and smoked the meat to preserve it for the winter months.

VEGETABLES AND FRUITS

When the early settlers came to Alberta they found many fruits and vegetables growing wild. Saskatoons, blackberries and dandelion greens were only a few of the wild berries and plants that could be eaten.

Vegetables like cabbage, turnips, carrots, potatoes, onions, beans and peas were popular foods when the settlers began to plant their own gardens. Their recipes show they used these vegetables a great deal.

Corn was used in many ways. It could be ground into cornmeal. It could be boiled or baked in a fire. It could be used to make cornbread or pancakes. Sometimes it was used as a substitute for coffee.

Wild and home-grown fruit were eaten straight off the bush or tree and were used to make pies. They were also used to make drinks.

RECIPE FOR DANDELION COFFEE

Take a long tap root of a dandelion plant and wash it carefully. Cut it into small pieces. Roast in front of a fire or in a slow oven until it is dry and crisp. Grind it in a coffee grinder and use it as you would ground coffee.

"SIN AND MISERY"

"Trips to town were not made for fun in those days. The brown sugar and cheap green tea were carefully hoarded so that Sunday visitors and strangers might be more royally entertained. The families themselves drank milk when it was plentiful, or 'coffee' made from burned bread crusts or roasted wheat. The latter they called 'Sin and Misery' because, as they said, it was a sin to burn the bread and wheat, and misery to drink the coffee." (Scarrow and Gibson, Indians of Canada and Prairie Pioneers, p. 140)

FOOD FROM THE LAND

"We had no fancy food but mother always made sure that we had milk, homemade bread, wild fruit and plenty of vegetables. Strawberries, raspberries, saskatoons and cranberries could be had for gathering them. We ground corn between two flat stones found on the farm and could get our wheat ground at a small mill ten miles or so distant. During the winter we could get rabbits and partridge and occasionally we had venison. Tasty soup could be made of these. Rabbit pie properly made with good pastry, some vegetables and the right seasoning was a real treat." (Robertson, Heather, Salt of the Earth, p. 84)

HOMEMADE SOUP

"Life in the back country was becoming more tolerable. The narrow wooded lanes were gradually widened into open roads, letting more sunlight into the district and into our hearts. The roads were still water-sogged and barely passable, yet they seemed to bind us more closely to our neighbours.

That spring father got a job with a road crew. Since his work took him about five miles north (too far to commute) he lodged at a farm home in the work area and we brought his food supplies to him every few days. One day mother prepared a large pot of beet soup - without beets! It tasted almost like the real thing, but was made from two wild pot-herbs (pig-weed and sorrel); a recipe she had learned from her mother. Both plants are non-poisonous and have a slightly sour taste. But mother cut them into small bits, dumped the ingredients into a big pot of boiling water, added salt and a few spices, then seasoned it with plenty of cream. This was to be a treat for father."

(Romaniuk, Gus, Taking Roots in Canada, p. 45)

B. Things to do:

1. Answer in complete sentences.

- (a) List at least three foods the settlers ate which we no longer have to eat if we do not want to.

- (b) Tell of two reasons why we have a greater choice of foods today.
- 2. Pretend you have to cook for your homesteading family. You will need to be ingenious to make your meals tasty and varied.
 - (a) Explain the meaning of "ingenious." (Use your dictionary.)
 - (b) Draw and label some of the foods you would serve your family.
 - (c) What things would you do to make your meals tasty and varied?

READ THE FOLLOWING STORIES:

THE SETTLERS BUY FOOD

"The food that could not be shot or grown had to be bought at the nearest village which, for many, meant a journey of fifty or more miles. Sugar and flour, oatmeal and syrup, salt, baking soda and tea were usually on the shopping list. To pay for these, the settler might sell a wagon-load of fresh vegetables, if his garden had grown well, or buffalo bones might be gathered from the prairie and sold for \$7.00 a ton.

The fathers of the families often left the homestead for months, working elsewhere - on the railway, or for more successful farmers - to raise the money that would pay for the things his family needed." (Hill, Douglas, The Opening of the Canadian West, p. 215 - 216)

"A GROCERY LIST"

"This list conveys an idea of the amount required for one male settler for one year:

500 lbs. flour	\$12.00
200 lbs. bacon	19.00
75 lbs. sugar (brown)	3.00
10 lbs. coffee	3.00
10 lbs. tea	2.50
10 lbs. baking powder	1.00
1 doz. beef extract	3.00
1 doz. condensed milk	1.50
50 lbs. rolled oats	1.04
20 lbs. corn meal	.29
25 lbs. candles	2.50
100 lbs. beans	1.67
10 lbs. barley	.25
10 lbs. split peas	.25
25 lbs. rice	1.05
10 lbs. prunes	.63
20 lbs. evaporated apples	2.20
15 lbs. evaporated apricots	1.43
12 lbs. evaporated vegetables, assorted	2.16
5 tins assorted soups	3.00
20 lbs. salt	.20
1 lb. pepper	.15
12 lbs. soap	.40
3 doz. yeast cakes	1.44
1 lb. mustard	.40
21 lbs. baking soda	.63
½ gal. lime juice	2.40
5 boxes matches	.50
1 doz. bottles Saccharine	
300 tablets in bottle	
Each tablet sufficient for one large cup of tea."	

(Vincent and Meakin, This Land These People, p. 100)

C. Things to do:

Instructions:

1. Answer in complete sentences.

- (a) Why would a settler buy such large amounts of each item?
- (b) How much of each of these items does your mother buy at a time? flour _____, sugar _____, bacon _____.
- (c) What is the total cost of the list of groceries purchased by early settler? (Check your answer with your teacher.)
- (d) Some of the items on the grocery list were used only on special occasions. Which ones do you think they were? Why were they not used very often?
- (e) Tell in your own words the meaning of these words. Use a dictionary.

extract condense evaporate
- (f) Ask your mother how much money she spends on groceries in one week. Divide the amount by the number of people in your family. Your answer will tell you about how much it costs to feed one person in your family for one week.

Now figure out the cost of one person's groceries for one year. Compare this total to the cost of the grocery list for the settler. (NOTE: To find the cost for one year multiply thte total cost for one week by 52.)

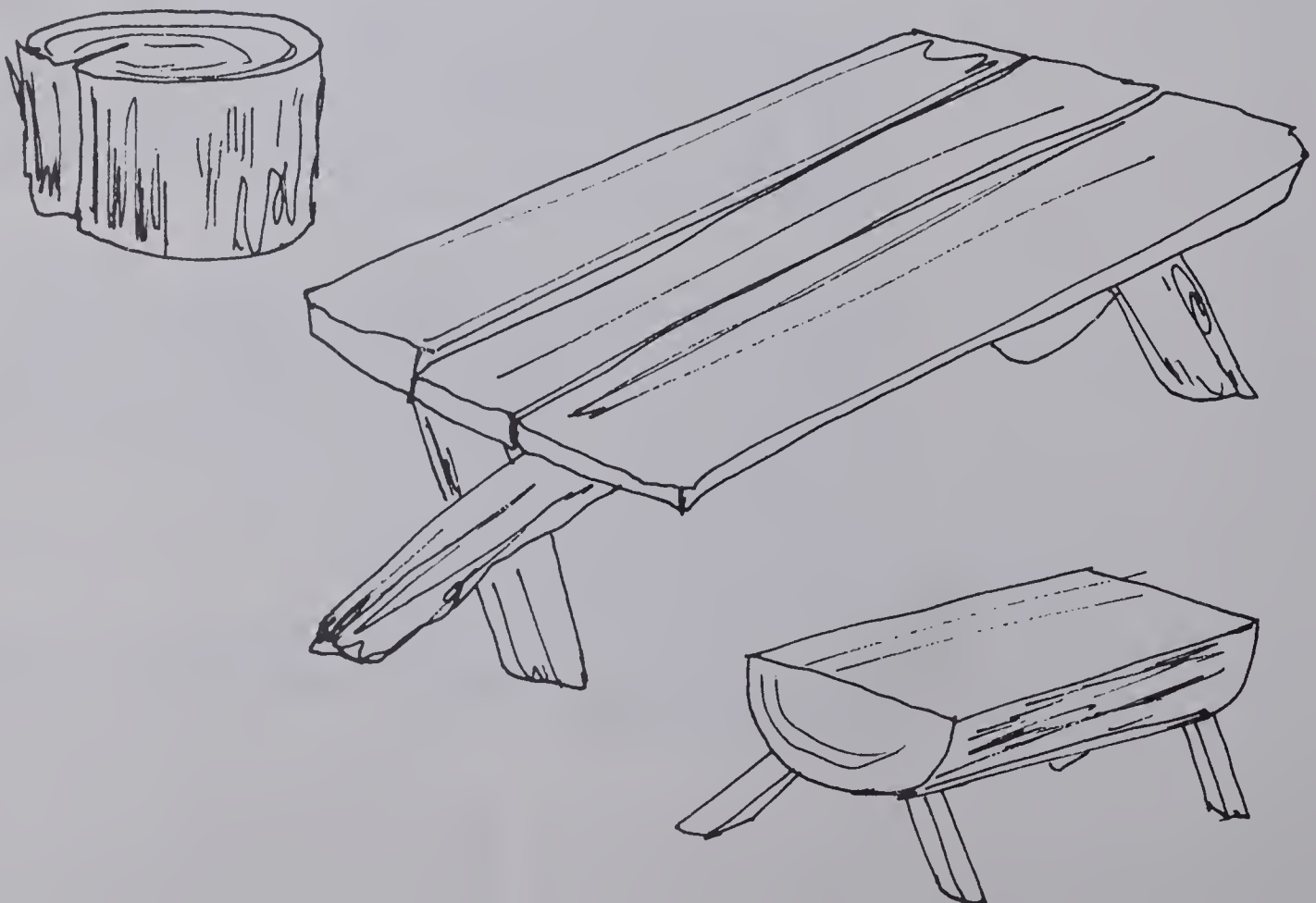
HOUSEHOLD GOODS

The first settlers brought very few household goods with them. There were no mail order catalogues or stores in which to buy furniture and household items. During the first years, the early settlers made nearly everything they used around the house.

READ THE FOLLOWING STORIES AND SKETCHES

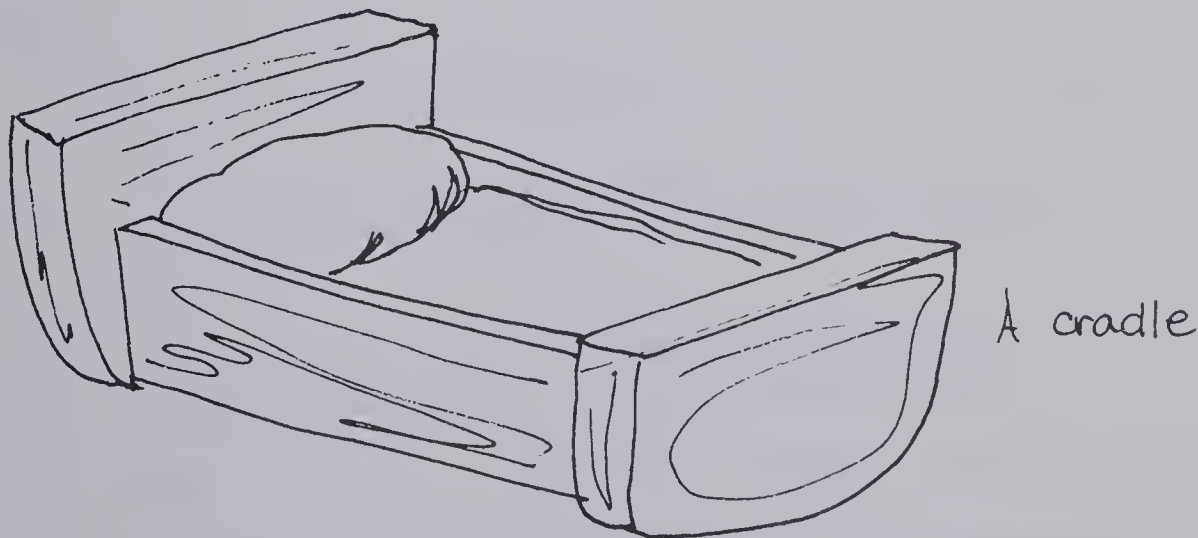
FURNITURE

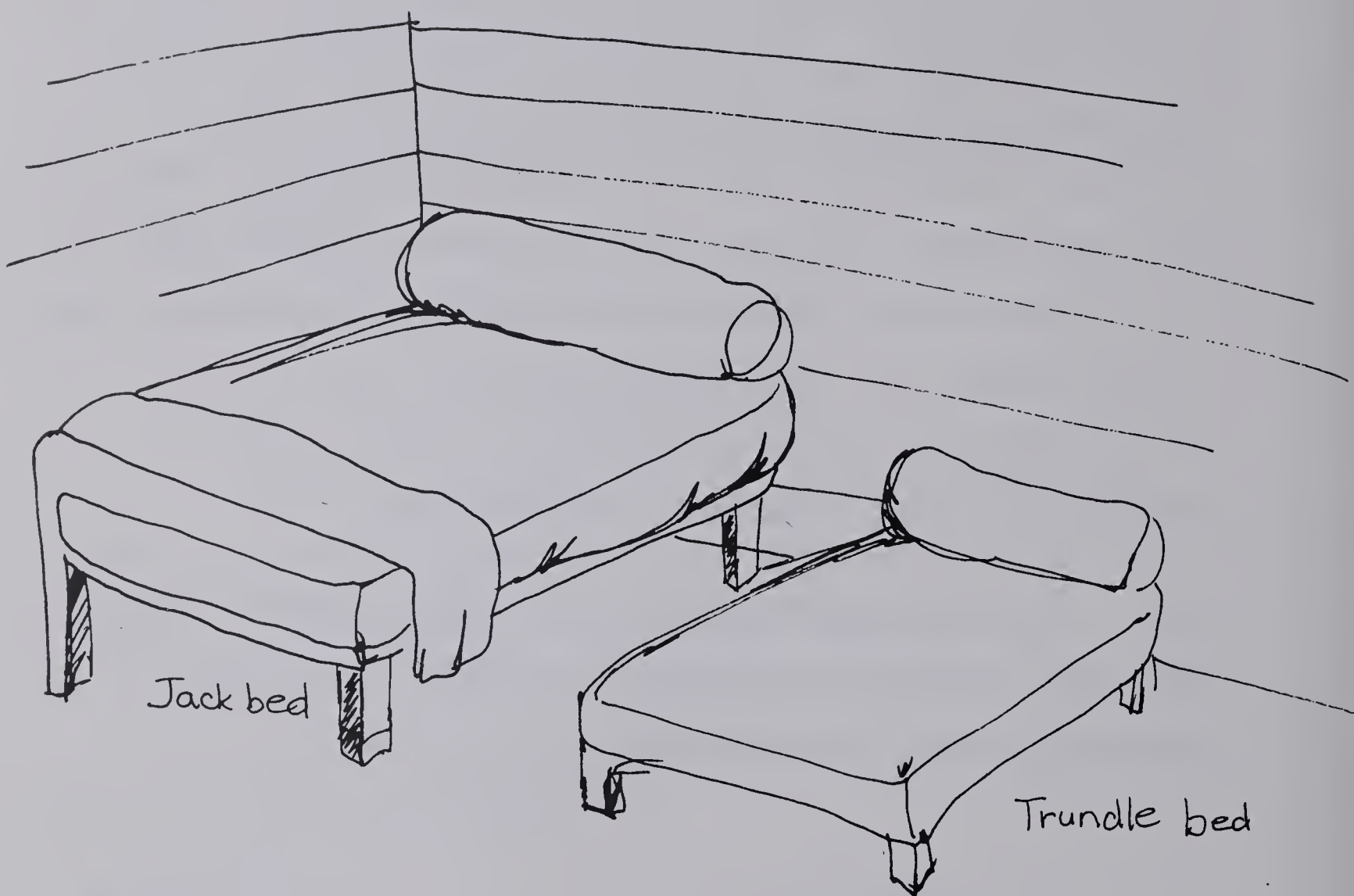
The first furnishing in the homes of the early settlers were very simple. A short piece of log was a stool or chair. A few planks of wood lashed together made a rough kitchen table. A rough bench was made by cutting a length of log in half and fastening four wooden poles, one at each corner, to the log as legs.



Beds were built into the corner of a sod hut or cabin as it was constructed. The beds had no springs or soft mattresses. Planks lined the bottom and blankets and robes piled in to add warmth and comfort. The large bed where the parents slept was called a JACK BED. The small bed beside the large bed was called a TRUNDLE BED. The children would sleep on the trundle bed at night. In the daytime, the trundle bed was kept under the Jack Bed to leave more space in the house. Babies slept in cradles set on the floor near the Jack Bed.

A few simple shelves were built along the walls. Sometimes a cupboard or buffet was built. Wooden pegs on the walls made coat-hangers.





HOUSEHOLD ITEMS

The early settler brought some items with him but many goods were made from wood. The early settler's meal was often served on wooden plates or TRENCHERS and eaten with a wooden spoon. If copper or tin bowls were not available, food was served from wooden bowls with a wooden ladle or dipper.

In the kitchen many wooden items were used. Flour and water were stored in wooden barrels. A hand-made wooden scoop was used to get the flour out. Butter churns and moulds were made out of wood. Wooden rolling pins were used to roll out the dough. Wooden tubs were used for washing dishes, clothes and taking baths. Even brooms and shovels were made out of wood whenever metal was not available.

D. Things to do:

Instructions:

1. Answer in complete sentences in your scribbler.
 - (a) Why did early settlers not bring much furniture with them when they came to Alberta?
 - (b) Tell in your own words the meanings of the following words. Use a dictionary.

butter churn trencher ladle butter mould
 - (c) List 5 items you have in your home which an early settler would not have.

2. Use reference books to find pictures of the inside of the homes of the early settlers. Draw a picture of the kitchen corner.

READ THE FOLLOWING STORY:

EARLY SETTLERS' MEDICINE

Early settlers brought some medicines with them from their homelands. Often they took along seeds from special plants and herbs so they could grow their own medicines wherever they settled. They also learned of new plants and medicines from the Indians they met.

Some of the early medicines seem very strange to us today. Mashed garlic was rubbed onto the scalp to cure baldness. Rose hips were brewed into teas and tonics. Today we know that rose hips are a rich source of Vitamin C. Scurvy, one of the diseases that affected early settlers, was caused by a lack of vitamin C.

Some Remedies

The following recipes are suggested as ways to cure some problems:

Cough or Cold

Take a double handful of garden sage. Put in a pan with one ounce Liquorice. Cover with the best vinegar and simmer the strength out. Keep it covered till done. Strain, dry and sweeten with honey to form a syrup. Serve a teaspoon full three times an hour until better.

Deafness

Keep the fat from the kidneys of wild Rabbit; griddle it and drop in two drops in each ear each night; rub cotton batting to a point, dip it in the mixture and place in ear. Let it remain until better.

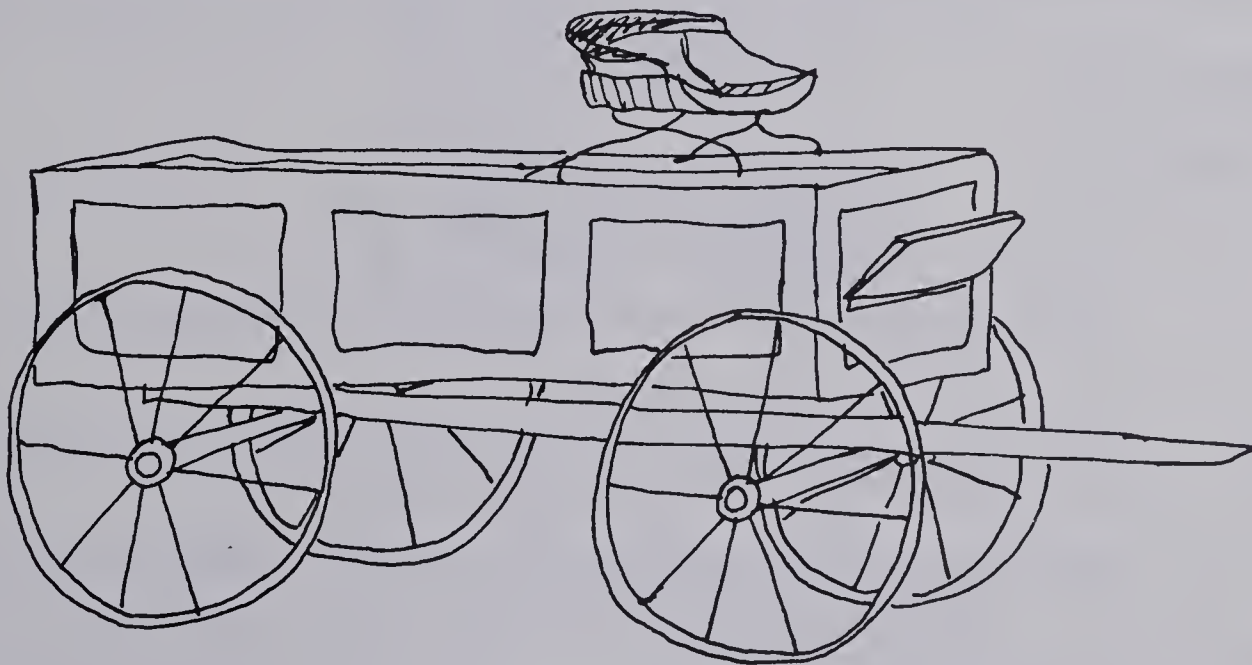
To Strengthen the Nervous System

One quart strong Slippery Elm Tea; one pint black currant wine; one ounce Tincture of Iodine. Dose: one wine glass full - three times a day.

READ THE STORY:

TRANSPORTATION

Early settlers had to transport goods many miles. The first settlers used Red River carts to haul goods. Later, the homesteader used a farm wagon to take his grain to market.



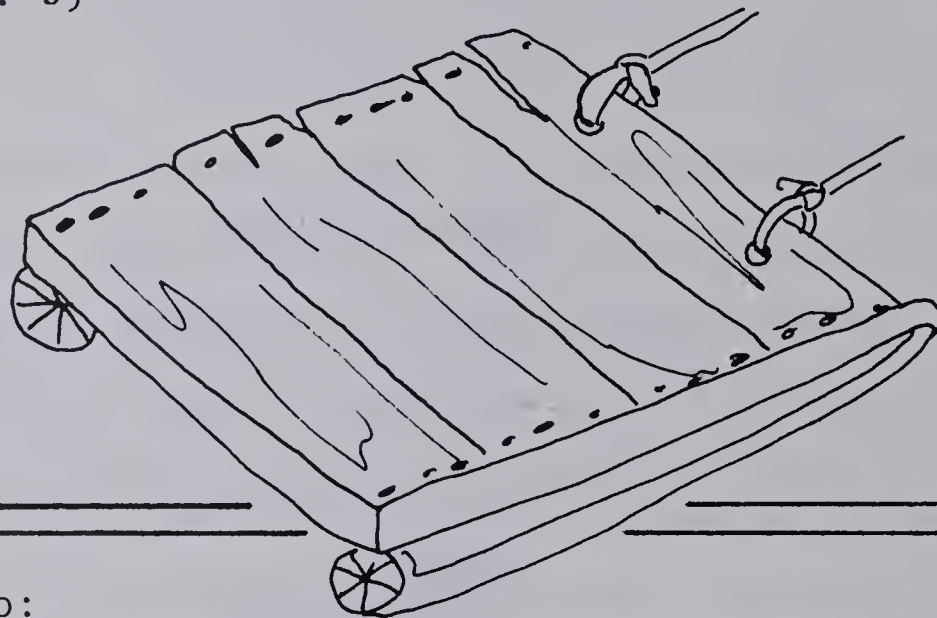
FARM WAGON

This fine wagon has a strong box made of the best dried wood. The wheels are well ironed and boiled in hot oil. The hubs and spokes are made of the finest oak and black birch. This wagon is hand painted and carefully built.

Cost: \$42.00

A stoneboat is a low sled-like vehicle whose runners were shaped logs or railway ties. The runners were fastened together with a wooden platform. Stoneboats were used for removing stones from fields and for other heavy hauling. (B.C.T.F. Lesson Aid LA9226, Homesteading in Saskatchewan, p. 5)

Stoneboat



E. Things to do:

Instructions:

1. Answer in complete sentences.
 - (a) From what materials was the farm wagon made?
 - (b) Do you think most of the wagon was made by hand? Why or why not?
 - (c) What do you think would be some of the disadvantages in using this wagon?
2. Use a reference book or encyclopedia to locate information about a Red River cart. Write three facts about the Red River Cart in your scribbler.
3. Draw a stoneboat. Tell why it would be hard to pull along the ground?

READ ABOUT THESE ITEMS:

TOYS

The children of early settlers had some toys. Many times the parents, grandparents or older brothers and sisters made the toys. Some of the toys are shown below.

DOLL PERAMBULATOR (BUGGY)

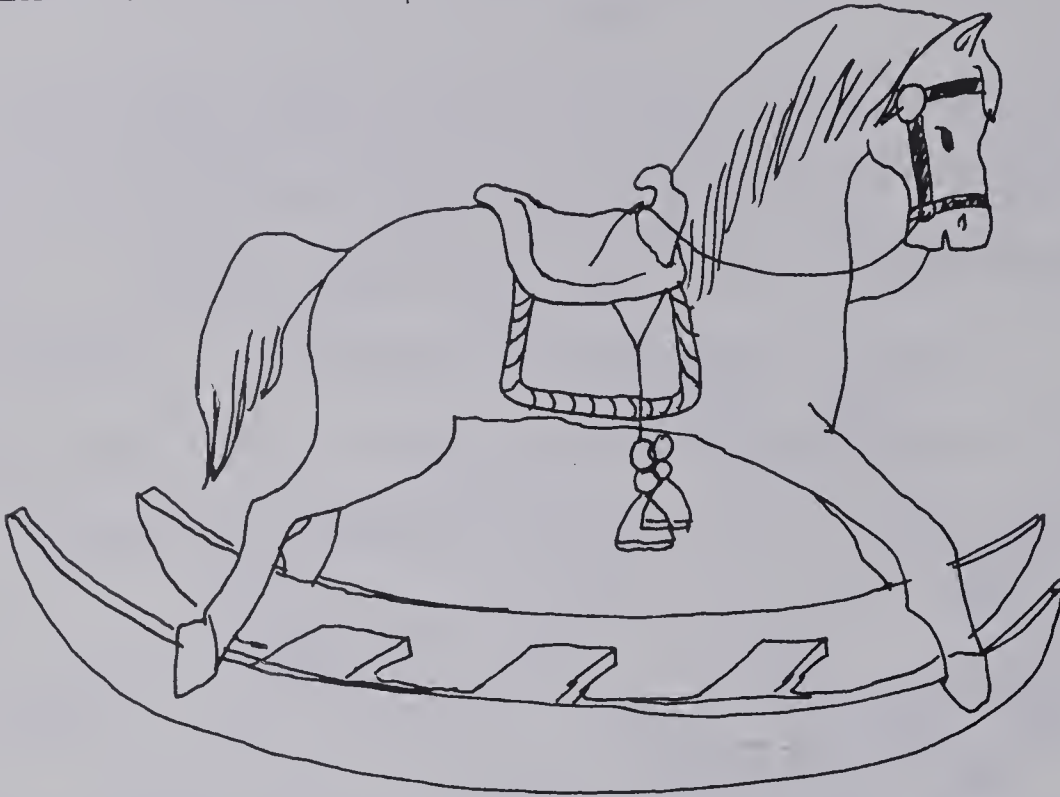
This perambulator has a wooden frame, four metal wheels and no springs. It is hand painted and nicely finished. Colour: Black Cost: \$1.15



ROCKING HORSE

A child's delight! This rocking horse is covered with real horse hide. Even the flowing mane and tail are made from real horse hair. A leather saddle and bridle comes with every rocking horse. This horse is mounted on wooden rockers and will give years of carefree rocking.

Height from saddle to floor is 36 inches; length of stand is 60 inches. Cost: \$5.95



F. Things to do:

Instructions:

1. Study the pictures and answer in complete sentences.
 - (a) What was the perambulator used for? What do you call it today?
 - (b) From what materials was the perambulator made?
 - (c) From what materials was the rocking horse made?
 - (d) How is this horse different from the rocking horses today?
 - (e) How have toys changed since the time of the early settlers?

- (f) Do you think children of today would like to play with these toys? Why or why not?

REVIEW

G. WRITING A PARAGRAPH

Instructions:

1. Write a paragraph explaining your reasons why you would rather live today or long ago in the home of an early settler.

REVIEW

H. Things to do:

COMPLETING A RETRIEVAL CHART

Instructions:

1. Construct the following chart on a large sheet of paper.
2. Fill in the chart by drawing pictures or cutting pictures out of magazines and catalogues and pasting them in the right place.

HOUSEHOLD ITEMS	EARLY SETTLERS	MY HOME
To clean the floor		
To serve your food		
To sleep on		
To sit on		
A baby's bed		
To hang your clothes		
To travel with		
To play with		
A medicine		

A. p. 373

1. (a) If a gun was available settlers could shoot duck, geese, prairie chickens, moose, skunk, rabbit.
- (b) If a settler had no gun, he may fish for trout and pike; set snares for rabbits and gophers.

2. ANSWERS WILL VARY

3. ANSWERS WILL VARY

B. p. 376-377

1. (a) Three foods settlers ate but we no longer eat are dandelion coffee, rabbits, wild plants.
- (b) We have greater choice of foods because we have world trade and transportation, refrigeration and preserving procedures which allow us to eat food from any part of the world.

2. (a) ANSWERS WILL VARY

(b) ANSWERS WILL VARY

(c) ANSWERS WILL VARY

C. p. 379

1. (a) A settler bought large amounts of food because he did not have the opportunity to get to a store or grocer very often.

(b) ANSWERS WILL VARY

(c) Total cost of groceries purchased by settler is \$66.02.

(d) Items used on special occasions include: sugar, tea, apples, apricots, lime juice. These items were expensive and hard to get.

(e) ANSWERS WILL VARY

(f) ANSWERS WILL VARY

D. p. 383-384

1. (a) ANSWERS WILL VARY

(b) ANSWERS WILL VARY

(c) ANSWERS WILL VARY

2. ANSWERS WILL VARY

E. p. 386

1. (a) Materials used were wood (oak and birch), paint and possibly some iron axles (does not say).

(b) Most of the wagon fashioned by hand because wood can be easily cut and shaped; settlers did not have factories nearby.

2. ANSWERS WILL VARY

3. ANSWERS WILL VARY

F. p. 388-389

1. (a) Perambulator was used to carry babies or dolls. Today we call it a pram, doll or baby buggy.
- (b) Made of wood, metal.
- (c) The rocking horse used materials of wood, leather, horse hair.
- (d) Most rocking horses today are constructed out of metal or plastics.
- (e) ANSWERS WILL VARY
- (f) ANSWERS WILL VARY

G. p. 389

1. ANSWERS WILL VARY

H. p. 389

1. ANSWERS WILL VARY
2. ANSWERS WILL VARY

WILD FLOWERS OF ALBERTA

Adapted from The Alberta Story
Animals and Plants: Excerpt #12

WILD FLOWERS OF ALBERTA

Alberta has many lovely wild flowers. It is important for us to learn that picking any flower is not a good idea. If the root is disturbed the plant may die. In the case of bulb-like roots the plant will not survive when the leaves are picked because the food cannot be manufactured and stored in the bulb for the next year's use.

Flowers should be left to grow wild and give pleasure to everyone who passes by. Then all people can enjoy them.

Western Red Lily

This is a plant which grows from 15 to 35 centimeters, has red or orange petals with black spots. The lily grows from a white bulb. It is found in moist areas. It is becoming scarce from much picking which disturbs the bulb.



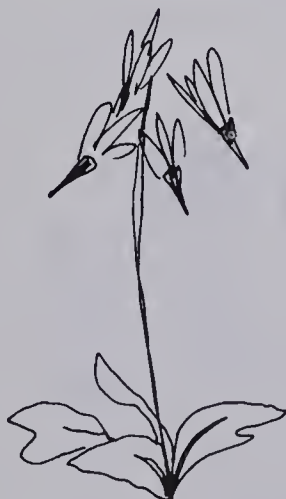
Wild Rose

The plant looks like a bush or shrub with a prickly stem. The flowers are pink and fragrant. Some people eat the rose hips which contain seeds. The wild rose is the floral emblem of Alberta.



Shooting Stars

This plant is a herb. The flowers are very showy with pink to purple petals swept back. This flower is found in wet areas but is becoming rare. It should not be picked.



Black-Eyed Susan

This is a single flower which grows on a long stalk. The flowers are yellow in color with a dark brown center. They are most often found in open areas and may be picked in moderation.



Indian Paint Brush

The Indian Paint Brush is a parasite. This means it lives on the roots of other plants. The leaves are usually red or yellow in colour. The flower is about 3 centimetres long with fine down of a greenish colour touched with crimson. This flower may be picked.



Prairie Aster

The Prairie Aster is a common plant in Alberta. It blooms in late summer or early fall. It has a bluish purple or white flower with numerous petals.



Lady Slipper

This plant belongs to the orchid family and should be protected. The small yellow Lady's Slipper is common in Alberta. It grows from 20 to 35 centimeters high and has large yellowish flowers marked with purple lines. It smells very nice. The flower grows in damp soil in poplar woods.



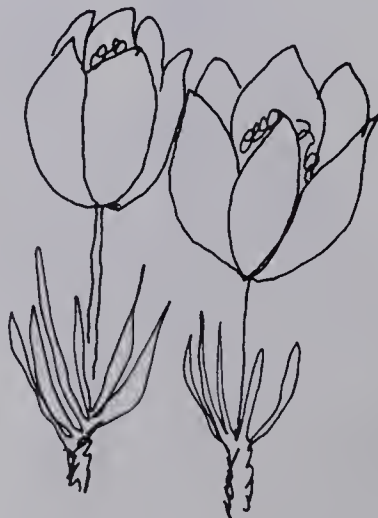
Fireweed

This plant grows all over North America. It grows quickly in burnt over forest areas and is found along road sides and waste places. Flowers are from pink to purple and grow on a central stalk. The leaves are pointed and the seed pod spreads many white-tufted seeds. Livestock eat it and it provides a good source of honey for bees.



Crocus

The crocus is a soft mauve early spring flower. It grows on a tall, feathery stem. The crocus is sometimes a trouble to sheep ranchers because it has some poisonous qualities.



Buffalo Bean

This is an early blooming plant which is very bright and colourful. The flowers are a very bright golden yellow and grow in thick clusters from a central stalk. The leaves are covered with silky grey hairs. The plant grows from 12 to 45 centimeters high in large masses in the southern part of the province



Things to do:

A. Wild Flowers of Alberta

Instructions:

1. Draw the following chart in your scribbler.
2. Complete the chart by filling in the answers from the booklet.

WILD FLOWERS OF ALBERTA	
Flowers that can be picked	Flowers that should not be picked
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

COMPLETE ACTIVITY B or C.

B. Let's Pretend

Instructions:

1. Pretend that there are no wild flowers in Alberta of the kind described in your booklet.
2. Write a short story telling what Alberta would be like without the flowers. Would Albertans miss them? Why or why not? Would you miss the flowers? Are wild flowers useful to Albertans?

C. Writing Haiku

Instructions:

1. Carefully study a picture (try to find a coloured picture) or a flower outdoors. Notice its colour, appearance, smell, touch and the feeling it gives you.
2. Write a haiku poem about your flower.

ANSWER KEY

A. p. 399

1. Wild Flowers of Alberta

2. Flowers that can be
picked:

1. Wild Rose

2. Black-Eyed Susan

3. Indian Paint Brush

4. Prairie Aster

5. Fireweed

6. Crocus

7. Buffalo Beans

Flowers that should not be
picked:

1. Western Red Lily

2. Shooting Star

3. Lady Slipper

B. and C. p. 400

ANSWERS WILL VARY

BIRDS OF ALBERTA

BIRDS OF ALBERTA

More than three hundred kinds of birds have been identified in Alberta. Birds are valuable to Albertans as a beauty in nature; as a way of keeping insects down and nature in balance; as a source of food and as a sport. As you read about the different birds try to remember if you have seen any of them in your area of the province.

Mallard

This surface-feeding duck is a common summer resident. The male is unmistakable with his glossy green head and upper neck which are separated from the chestnut colored lower neck and breast by a white band. The purple wing patch is bordered by a band of black and an outer one of white. The female is a much less showy bird than the male with a brownish grey plumage. All species of duck moult twice a year. Nests which are on the ground are made of grass and leaves lined with down and usually contain from 8 to 12 greenish eggs. Mallards winter from southern Canada as far south as Panama and return quite early in Spring.

Common Crow

A common summer resident. Both adults have the same plumage which is glossy black turning almost to purple in some lights. Crows eat almost anything: they destroy crops, devour the eggs and young of smaller birds, but they

also rid the land of many worms and insects. Control of these voracious birds can be exercised. Crows build rather clumsy looking nests of twigs lined with bark and grasses in trees and bushes and lay from 4 to 7 greenish blue eggs which are blotched with brown. The birds assemble in large noisy gatherings before they migrate in the fall. It is easy to confuse the crow and the raven for both are black although the raven is considerably larger. The raven stays here in the winter while the crow goes south.

Redwinged Blackbird

A common summer resident. The male is easy to identify being all black except for the red patches on his shoulders. The female is a very plain bird with brownish black plumage streaked with grey. Often several pairs of blackbirds form a colony and build their nests in bushes or reeds near the water. These nests are made of grass or reeds and lined with finer grass: They contain from 3 to 6 bluish eggs with darker markings on them. The male blackbird has a rather loud voice, saying OKA-LEE-A, and sounds like a telephone ringing. The birds go south in October and return quite early in spring, with the males usually preceding the females.

Baltimore Oriole

A common summer resident. This is a striking bird with jet black feathers on the head, neck, back and the center of the tail. The breast and lower part of the back are bright orange and there is one white wing bar. The upper parts of the female are greenish and she has two white wing bars. The Baltimore Oriole nests in the southern part of Canada but migrates in winter, often to Mexico. The nests, containing 4 to 6 white eggs with darker markings, are hung near the end of branches in high trees: they are quite deep and are woven from grasses, string and hair. The rich mellow whistle, PET-ER is often to be heard in the parklands where the bird breeds most abundantly.

Robin

A common summer resident. When the robin returns from its winter quarters we know that spring will not be long in coming. The bird is quite easy to recognize with its dark grey back and chestnut red breast. The colouring of the female is just a little duller than that of the male. The robin breeds all over Canada as far north as the tree line, and will often nest in trees or bird boxes near to houses. The nests which are coarsely made of grass and straw are bound with mud and contain from 3 to 5 bluish green eggs. The robin eats many worms and insects but also

steals many small fruits from gardens. Two lots of young are often raised in one season.

Black-Billed Magpie

A common resident. This large black and white bird with its heavy black bill and long tail is well known in Alberta. Male and female both look alike. The magpie builds a domed nest of twigs with an inner nest of grasses and mud: the entrance or entrances are in the side and the nest usually contains from 6 to 9 greyish green eggs with brown blotches. It is a member of the crow family, and like the crow will eat almost anything, stealing the eggs and young of both wild and farmyard fowl.

Ring Necked Pheasant

A common resident. The pheasant is not a native bird of Canada, but originally lived in southern China and Japan. The male is a very distinctive bird with a very long tail, glossy purple head and neck and a bronze and black body. There is usually a white ring around the neck, from which the name of the species is derived. The legs have no feathers. The female is a much smaller bird with a cream coloured throat and buff upper parts. Pheasants make their nests on the ground from grass and leaves and lay from 6 to 12 olive colored eggs. It is usual to find several females with one cock in the spring. A pheasant will eat almost everything

but grain is its staple food especially if it is near grain fields. In spring the males perform a courting dance during which they strut and fight. The sacs on their necks are inflated with air and when this air is released a booming sound is made.

Bohemian Waxwing

Fairly common resident. This bird is seldom seen in the summer as it breeds in the province's northerly coniferous forests, and comes south only in the fall when it migrates. It is quite common to see flocks of them feeding on mountain ash bushes in the middle of towns. Both male and female have the same colouring; the main colour is greyish brown, the forehead golden chestnut, and there is a distinctive black bar running from the beak over the eye. The wings are dark with a white bar and some feathers are tipped with a substance like sealing wax from which the bird derives its name. The tail has a yellow band. The nest which is made of twigs and grass lined with mosses contains from 4 to 6 blue eggs lined and dotted with black. It is easy to confuse the Bohemian Waxwing with the Cedar Waxwing, but the former is chestnut brown under the tail and has white on the wings while the Cedar Waxwing has a white undertail surface. The Cedar Waxwing is a summer resident and winters further south than Alberta.

Black-Capped Chickadee

A common resident. The friendly little bird does breed all over the province of Alberta but is not common in the prairies or the forests. Both sexes are alike in plumage which is bluish on the back, black on the head and hindneck and brownish on the tail. Below the eye the face is white, together with the sides of the neck. The throat is black. The nest of the black-capped chickadee is to be found fairly close to the ground in a rotting stump or tree. It is made of grass and often lined with rabbit hair and contains from 6 to 9 speckled white eggs. Their clear CHICK-A-DEE-DEE call always sounds cheerful. Like the woodpecker the chickadee can hang upside down or sideways when he is hammering at wood for insects

Sharp-Tailed Grouse

A common resident, more widely known in Alberta as the prairie chicken. The plumage of both male and female is alike. The upper parts are of buff, black, white and brown but the general effect is brown; the under parts are mostly white. The tail feathers are graded with the two longest in the middle giving the impression of a sharp tail. Feathers grow right down the legs as far as the toes. The so-called prairie chicken is seldom found in open prairie but prefers bush.

Snow Bunting

Common winter resident. The snow bunting breeds in the tundra but migrates south to southern Canada as far as Florida for the winter. In the northern part of Alberta they are seen only in the fall and the spring as they pass through, but they are common in the southern half of the province in winter. Snow Buntings are easy to identify as no other comparatively small bird shows so much white in flying. The upper plumage is mainly white too except for a band of black feathers. In winter these black feathers are tipped with whitish grey. The snow buntings usually travel in fairly large flocks and can often be seen picking at seeds and also at grit on the roads.

Things to do:

A. Birds of Alberta

Instructions:

1. Read this booklet and select four birds which interest you.
2. Use a reference book or encyclopædia to locate a picture of each one of the four birds. Also check the "Flora and Fauna Kit" in your school.
3. Draw and colour each of the four birds. Below each picture print the name of the bird and tell three facts about it.
4. Mount your picture on the bulletin board for others to see.

B. Choose one of the following activities:

Instructions:

1. Write a short story about Jack Miner. Jack Miner did not live in Alberta but he suggested many good ideas for taking care of birds. Find out: Who was He? What did he do? Where did he live? Do you agree with what he did? Why or why not? Would you help him?

(Note: Use a reference book or encyclopædia to locate information about Jack Miner.)

OR

2. Sometimes birds become extinct or nearly extinct. Select one of the following birds and find out what happened to it and why. Pretend you are the bird and tell the story as though you were talking to a friend. The birds are:

Passenger Pigeon

Trumpter Swan

Whooping Crane

(Note: Use an encyclopædia, National Geographic Magazine, or reference book from your library to locate the information.)

OR

3. Use a reference book or encyclopædia to complete the chart that follows.

FACTS ABOUT BIRDS	
<u>Questions</u>	<u>Answers</u>
1. How long do birds live?	
2. Where do birds go when they migrate?	
3. What routes do they follow when they migrate?	
4. How fast do they fly?	
5. Why do birds migrate?	

Things to do:

C. Review

Match the bird with its colour by placing the correct letter in the space to the left.

- | | |
|--|---------------------|
| _____ glossy green head and purple wing patch | (a) Prairie chicken |
| _____ glossy black all over | (b) Blackbird |
| _____ red patches on the shoulders | (c) Chickadee |
| _____ bright orange breast and jet black feathers on head, neck, back and tail | (d) Waxwing |
| _____ chestnut red breast | (e) Crow |
| _____ large black and white | (f) Oriole |
| _____ purple head and neck with white ring around the neck | (g) Snow Bunting |
| _____ greyish brown and tail with yellow band | (h) Mallard |
| _____ bluish on the back and black on the head | (i) Robin |

_____ buff, black, white
and brown; effect is
brown

(j) Pheasant

_____ mostly white

(k) Magpie

ANSWER KEY

A. p. 410

ANSWERS WILL VARY

B. p. 411

ANSWERS WILL VARY

C. p. 412-413 (REVIEW)

(h) glossy green head and purple wing patch

(e) glossy black all over

(b) red patches on shoulder

(f) bright orange breast and jet black feathers

(i) chestnut red breast

(k) large black and white

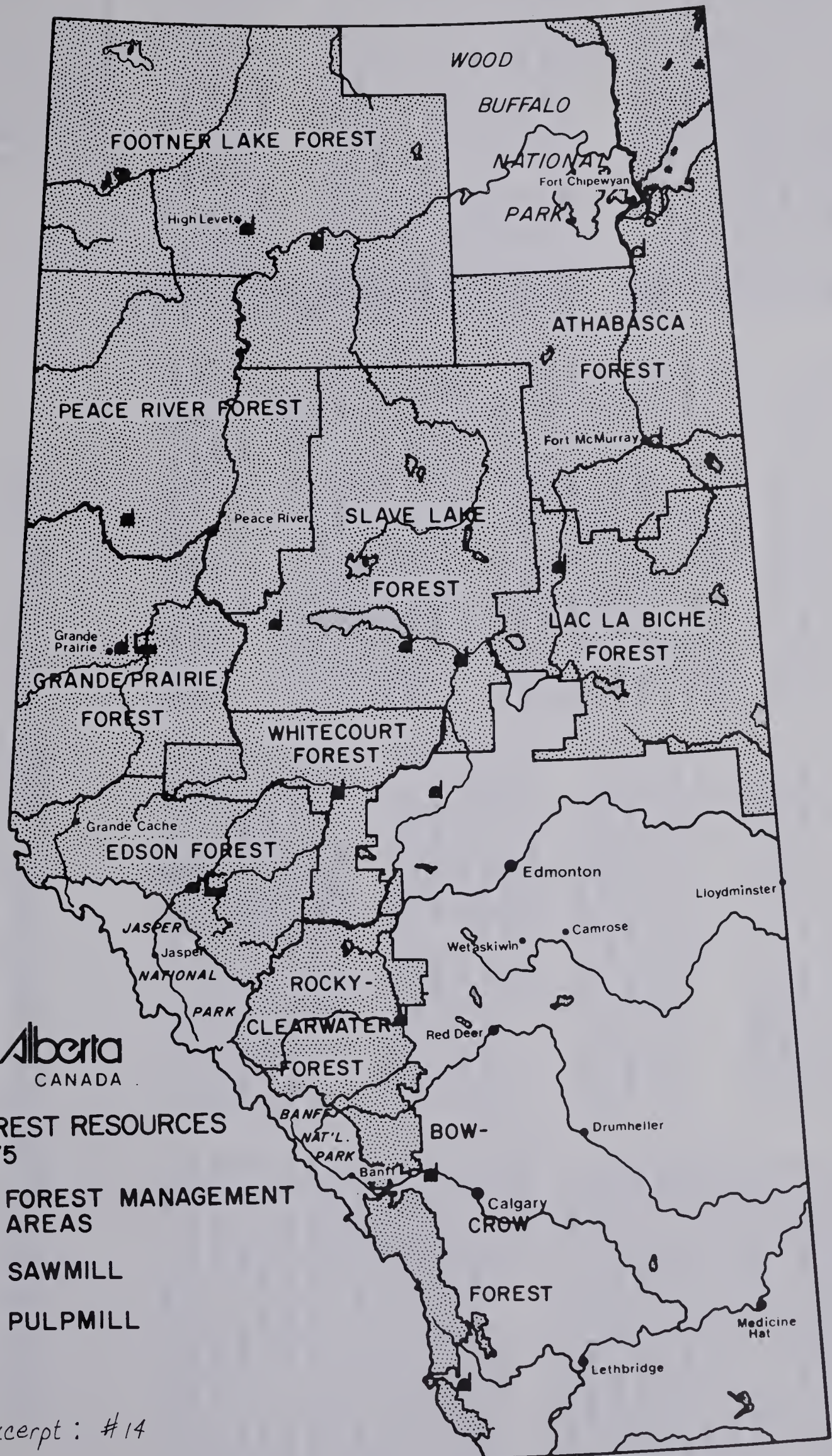
(j) purple head and neck with white ring around the neck

(d) greyish brown and a tail with yellow band

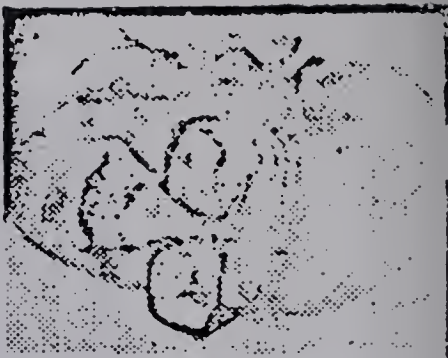
(c) bluish on back and black on head

(a) buff, black, white, brown

(g) mostly white



Excerpt: #14



Grant MacEwan

Disease once again threatens beleaguered buffalo

The North American bison race has had a rough time, especially since the coming of the white man, and now it is in trouble again. This time it is disease of an insidious kind.

One hundred years ago right now, the gun-killing was at its peak and the huge herds were being moved down for the reward of \$2 per hide on the American market. The rate of slaughter had no parallel in the category of large animals. The herds which in 1874 ran into millions of animals on the grass beside the Bow River, were for all practical purposes extinct eight years later.

It is an incredible story of ups and downs. After being close to the brink of extinction, the race was partly rehabilitated as a park herd in the big federal government enclosure at Wainwright and the animals multiplied until the Second World War when the government decided it needed a military range more than a buffalo park and again there was moving and slaughtering and

the main Canadian park herd was pushed back to Wood Buffalo Park in the area where Alberta and the North West Territories meet.

Now another reverse. This time it is anthrax, confirmed by Canadian Health of Animals officials on July 13 as the cause of recent deaths. It is not the first outbreak of that dread disease in the Wood Buffalo Park herd, presently containing 6,000 of the wild race.

Anthrax was discovered in the park in 1962 when routine flights revealed rotting carcasses to the east of Slave River and people working in animal health were greatly disturbed. Control of such a disease would be infinitely more difficult in wild animals and there was the fear of it becoming a lingering source of infection for domestic animals and humans.

Eleven years earlier Canada had its first and only direct experience with the ever feared foot-and-mouth disease when it appeared in an area east of Regina. As federal

veterinarians embarked upon eradication, destroying and burying infected and exposed livestock, one of the biggest fears was that the infection might reach the wild herds of caribou, deer, buffalo and others and become so scattered that it would never be eradicated.

It was a valid fear but fortunately foot-and-mouth disease did not reach the native animals before it was stamped out. The same fears, exactly, were expressed again when anthrax was discovered in the northern buffalo in 1962.

Before the end of that summer, bulldozers were used to bury 274 carcasses, but the disease didn't end there and the federal authorities realized the magnitude of the campaign they faced.

Buffalo calves were shipped to Lethbridge for use in determining if anthrax vaccination would be effective in the wild stock. The results were encouraging and, early in 1965, government workers undertook

to reach as many as possible of the 10,000 wild and scattered things with vaccine. Helicopters took the place of saddle horses in rounding up the buffalo and, in the end, the herd was vaccinated and the disease appeared to be arrested. But disinfecting a range of 17,000 square miles would be a rather hopeless undertaking, especially when the disease spores are of a kind capable of living in the soil for years. It is now suspected that certain areas of that northern soil have greater concentrations of spore infection than others.

Again federal veterinarians are converging upon the area of the National Park. This time they will have the benefit of the earlier experience in fighting anthrax and eradication is again a hope. But if, on the other hand, the disease — which is a threat to domestic livestock — gives indication of reappearing perennially, the whole future of the big park herd will have to be reassessed and the noble bison race will face another in a long series of critical tests.

MINERALS:

Student

Task Cards

Task Cards Using the Alberta Book & Encyclopædias
as Reference Books

MINERALS:

TASK CARD NUMBER 1: What is a Mineral?

1. Read page 75 of the Alberta book. In your scribbler write down what they say a mineral is.
 2. Look up the word mineral in a dictionary and copy its meaning down.
 3. Write down your own meaning of the word mineral. Start your sentence like this: I think a mineral is ...
-

MINERALS:

TASK CARD NUMBER 2: How Indians Used Minerals

Read the following article:

A study of Indian culture and accounts written about Indians by early explorers indicates that the Indians used only a few of the minerals found in Alberta. The Indians long ago did not have a written language which tells about their life so we have to try to find information elsewhere. For more than three centuries, the records and reports of the Hudson's Bay Company have given us valuable information about Indian and pioneer days in early Alberta.

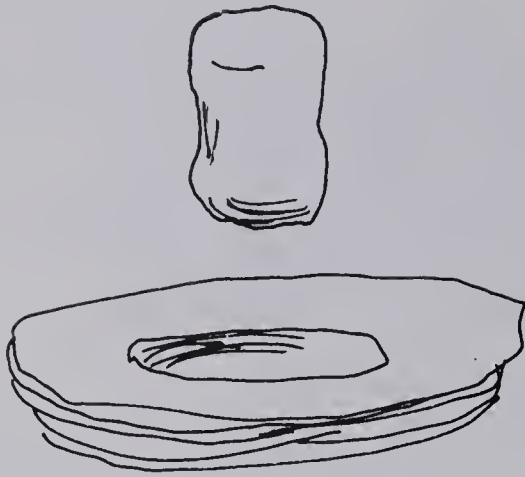
A study of the Hudson's Bay records tells us how the Indians used a number of minerals.

Read the chart and articles on the following pages.

Mineral Resources	Uses	Location in Alberta
salt	curing meat and fish	Lindbergh
ochre (a yellow or red clay containing iron)	dye skins and clothing yellow, red, brown decorate clothing and tents; ceremonial costumes for chief and medicine men	Medicine Hat Redcliff Lethbridge
flintstones (quartzlike rock)	arrowheads; blades of hunting knives	Edmonton Jasper
soapstone	decorate objects, bowls, lamps	Grande Prairie Edmonton
rocks & stones	mauls, amulets, cairns	All Alberta
coal, charcoal	dye-black to decorate clothing and tents; ceremonial costumes for chiefs and medicine men; fires to cook food and stay warm	Lethbridge Edmonton Medicine Hat Nordegg

The information in the chart tells about the uses of various minerals. Some of the uses you might not know about are explained on the following page:

A. This is a maul



The Indians used this top stone to smash or crush down into the hollow in the bottom stone.

Berries, meat, ochre or other materials were placed in the hollow and crushed.

B. This is an arrowhead



The Indians chipped a piece of flintstone into a sharp point.

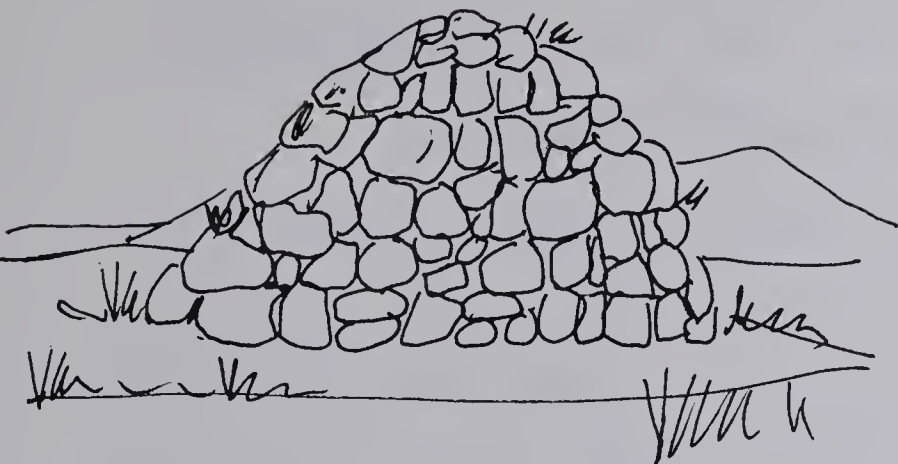
A leather thong fastened the arrowhead to the arrow.

C. This is an amulet



An amulet is a small carved ornament or charm worn around the neck on a leather thong to keep away evil spirits and protect the wearer.

D. This is a cairn



A cairn is a conical heap of stones built as a landmark or monument.

The Indians in southern Alberta built cairns to bury their great chiefs. Stone cairns can be found in the Medicine Hat area and on the shores of Pakowki Lake.

Something for you to answer:

1. Which two minerals do you think were most important to the Indians? Why
2. If a tribe of Indians lived far away from a mineral such as salt, how would they be able to get the mineral they needed? (Clue: find out what the word barter means.)
3. Why do you think the Indians only used a few minerals?
4. Do you think the Indians used their mineral resources wisely? Why or why not?

MINERALS:

TASK CARD NUMBER 3: How the Early Settlers Used Minerals

Read the following chart and articles:

Mineral Resource	Uses	Location in Alberta
salt	preserving meat and fish for food cattle feed	Lindbergh
sandstone	building houses, schools, government buildings	Calgary, Banff, Edmonton
lime	whitewash sod huts	Edmonton, Exshaw
clay	bricks pottery glass	Lethbridge, Edmonton, Calgary Medicine Hat Redcliff
coal	to heat homes and to cook food (coal-burning stoves) steam locomotives to pull trains steam boats	Crowsnest Blairmore Red Deer Grande Cache Drumheller Lethbridge

Cooking and Preserving Food

Salting was the method most often used to keep meat from going bad. The meat to be salted was cut in pieces, then put into a mixture of salt and water. The meat was left in the brine (salt water) long enough to let the solution work

through the meat. Salt pork was one of the main foods in pioneer days.

Smoking was another way the early settlers discovered to keep meat from going bad. Again the mineral salt was used in the smoking process. Before the meat or fish could be smoked, it had to be soaked in brine and carefully dried. Only then was it ready to be smoked in a smokehouse. The meat was kept smouldering for a week, so the smoke could work its way through all the meat and fish. The meat and fish was well-flavoured and kept for a long time.

Something for you to answer:

1. How did the early settlers preserve their food? Why?
2. Clay was used to make bricks and glass. How might the early settler have used these?
3. If you were an early settler which mineral would you consider to be most important? Why?
4. Do you think the early settlers used their mineral resources wisely? Why or why not?

MINERALS:

TASK CARD NUMBER 4: Reading a Chart

Today Albertans use many different minerals in many ways. What are these minerals and how are they used?

1. Turn to page 76 in the Alberta book. Study the chart carefully and answer the following questions.
 - a) Name the 6 minerals listed on the chart.
 - b) Name the 3 minerals used to make cement.
 - c) Which of the minerals listed are non-renewable resources? Why?
 - d) Name 5 uses of clay.
 - e) Tell which mineral is located near Lindbergh.

MINERALS:

TASK CARD NUMBER 5: Limestone

There are many deposits of limestone in Alberta particularly in the Rocky Mountain area and in the Athabasca and Clearwater area and in northeastern Alberta. Most of the deposits are found near railway lines.

1. In a complete sentence tell why it would be good to have railway lines near limestone deposits.
2. Tell where you think the limestone will go after it has been mined.

MINERALS:

TASK CARD NUMBER 6: Limestone

A limestone quarry is the place where the stone is dug, cut or blasted out. In Alberta about 600,000 tons of limestone are quarried each year.

1. In 1 or 2 sentences tell what effect the digging of limestone might have on the environment around the limestone deposits.
2. Tell whether you think this is good or bad. Also tell why you think that way.

MINERALS:

TASK CARD NUMBER 7: Limestone

Some limestone quarries (a place where the stone is dug, cut or blasted) mine limestone for use in making cement.

1. Use an encyclopedia to discover how cement is made. Explain in your own words how it is made.
2. Tell what cement is used for.

MINERALS:

TASK CARD NUMBER 8: Limestone

Some limestone quarries (a place where the stone is dug, cut or blasted) mine limestone for use in making lime.

1. Use encyclopædias to discover what lime is used for. Make a list of as many uses as you can find.
2. In your own words tell which use you think is most important for Albertans. Also tell why you think this way.

MINERALS:

TASK CARD NUMBER 9: Limestone

It is estimated that Alberta has reserves of limestone in excess of 22 million tons.

1. Use encyclopædias to discover what limestone is. In your own words describe it.
2. Use encyclopædias to discover how scientists test natural rock to see if it is limestone. Be sure to give your answer in a complete sentence.

MINERALS:

TASK CARD NUMBER 10: Sand and Gravel

Sand and gravel are found in extensive deposits throughout the province of Alberta. They are used mainly for construction projects in the local areas.

1. Make a list of things in your local community that have been made using sand or gravel.
2. Which use of sand and gravel in your community did you think was the most important use. Tell why you think this use was the most important.

MINERALS:

TASK CARD NUMBER 11: Sand and Gravel

In Alberta, road building accounts for two thirds or more of the gravel used. Other major uses are in earth dam construction and as railroad ballast.

1. Look up the word ballast in a dictionary. In your own words explain how gravel is used as a railroad ballast.
2. Should Alberta continue to use so much gravel to build roads? In your own words explain how you feel about this.

MINERALS:

TASK CARD NUMBER 12: Silica Sand

Various building products require silica sand in their manufacture. In Alberta the main use is for asphalt roofing tile (shingles) and fibre glass products.

1. Look up fibre glass in an encyclopaedia. Make a list of materials that fibre glass is used for.
2. Which of the above two uses for silica sand do you think is the most useful for Albertans? Why do you think this way?

MINERALS:

TASK CARD NUMBER 13: Silica Sand

Silica sand is used mainly in the manufacture of glass. Some deposits are located along the Peace River in northwestern Alberta and also along the Athabasca and Clearwater River in northeastern Alberta; however, at present, Alberta imports from other places some silica sand.

1. Can you explain why Alberta should import silica sand from other provinces and countries when some deposits exist within the province?
2. Do you think it is a good idea for Alberta to import minerals from other areas? Why? Why not?

MINERALS:

TASK CARD NUMBER 14: Clay and Shales

Clay and shales can be found in great quantities in Alberta. The clay is mostly of a low grade type - "common brick" clay - suitable for only low value structural wear such as common and facing brick, structural tile and drain tile. The few deposits that contain better clay provide clay for sewer pipes, flue liners, pottery and stoneware crocks. High grade clays are not found in Alberta.

1. Look in encyclopædias to discover what clay and shale are like. Describe them in detail.

MINERALS:

TASK CARD NUMBER 15: Sandstone

Over the years in Alberta sandstone has been mined and used for various reasons.

1. Use an encyclopædia to discover what sandstone is. Describe it in your own words.
2. Make a list titled Uses of Sandstone
3. Can you think of any places in your city or town that have used sandstone? Name them.

MINERALS:

TASK CARD NUMBER 16: Salt

There are two salt plants in Alberta at the present time. At Fort Saskatchewan a few miles north-east of Edmonton, salt is brined from beds as deep as 6,100 feet. At Lindbergh about 120 miles east of Edmonton, salt for domestic and industrial use is brined from beds 3,600 feet below the surface.

1. What do the words, salt is brined from beds mean? Perhaps an encyclopædia can help you with your answer.
2. Make a list of as many uses of salt as you can find.

MINERALS:

TASK CARD NUMBER 17: Sodium Sulphate

Alberta supplies 20% of Western Canada's saltcake or sodium sulphate needs. All of the production is from a single plant located at Metisko Lake. The main use of sodium sulphate is in the pulp industry. It is also a raw material in the manufacture of glass, sodium chemicals, synthetic detergents, pharmaceuticals, fertilizers and in dyeing, tanning and uranium processing. Sodium sulphate reserves in the province are estimated to be 1.5 million tons.

1. What does it mean when we say that Alberta has reserves of sodium sulphate?
2. Do you think Alberta should continue to export sodium sulphate to other provinces? Why or why not?

MINERALS:

TASK CARD NUMBER 18: Sulphur

Alberta is Canada's largest producer of sulphur and is also the world's largest producer of sulphur from hydro-carbon sources. About one-third of the sulphur sold from Alberta supplies Canadian industries, and the rest is exported. Sulphur must be separated from natural gas when it is mined.

1. Use an encyclopaedia to discover what sulphur is. Describe it in your own words.
2. Use the encyclopaedia to help you make a list showing the uses of sulphur.

MINERALS:

TASK CARD NUMBER 19: Dolomite

Large deposits of dolomite are found in the Rocky Mountain region of Alberta, but at the present time these are not being developed.

1. Use an encyclopaedia to discover what dolomite is and what it can be used for.
2. Why do you think Alberta does not mine dolomite at the present time? Try to give two or three reasons for your answer.

MINERALS:

TASK CARD NUMBER 20: Marl

Some deposits of marl can be found in Alberta.

1. Use an encyclopædia to discover what marl is and how it is used. Write down the information that you discover in your scribbler.

MINERALS:

TASK CARD NUMBER 21: Metallic Minerals

No commercial production of metallic minerals is currently taking place in Alberta even though some deposits do exist. Uranium and molybdenite have been found in the area north of Lake Athabasca, iron ore in the area around Clear Hills, calcium magnesium brines in oil producing rock formations and traces of titanium, nickel and zirconium in the Athabasca Oil Sands.

1. Can you think of reasons as to why these metallic minerals are not being mined at the present time in Alberta? (Clue: Think about location and quality of the metal.)

MINERALS:

TASK CARD NUMBER 22: Gypsum

Gypsum is the product from which plaster of paris is made. Large deposits can be found near Jasper and Fort McMurray.

1. Ask your teacher for a small amount of plaster of paris. Mix a little water with it. Watch to see how quickly it will harden. Describe in words what the plaster of paris was like before you added water, and after it hardened.
2. Using your nail or a sharp object try scraping the plaster of paris object that you have made. Describe what happens to it.
3. Using the encyclopaedia see if you can find out some other uses for gypsum.

ACTIVITY STATION

ACTIVITY STATION


SCAVENGER HUNT

Use the Atlas of Alberta to find the answers to each of the questions below:

1. Find out what year this atlas was published

2. Look at the map on page 1 showing Alberta's Setting:
 - (a) Name the province to the east of Alberta _____
 - (b) Name the province to the west of Alberta _____
 - (c) Name the country to the south of Alberta _____
 - (d) Name the territory to the north of Alberta _____
 - (e) Name the capital city of Alberta

 - (f) Name 5 National Parks located in Alberta
_____, _____, _____,
_____, _____
3. Look at the population map on page 53.
 - (a) Name the 5 cities with the largest population _____, _____,
_____, _____, _____
 - (b) Each small brown dot represents _____ people.
 - (c) The total population in Alberta on June 1, 1961 was _____

4. Look at the map on page 57 which shows the religious groups that most Albertans belong to.
- (a) Name the two religious groups that most Albertans are members of _____,
5. Look at the map on page 87 showing forest services of Alberta.
- (a) Tell whether the following places are located in a forested or non-forested area:
- Calgary _____
- Whitecourt _____
- Fort McMurray _____
- (b) Tell whether the following places have forest headquarters located there.
- Blairmore _____
- Grande Prairie _____
- Edson _____
- Elk Island National Park _____
- (c) What does this symbol represent
- 

6. Look at the map on page 95 showing the minerals of Alberta.
- (a) Which 2 minerals are found in the largest amounts?
- _____
- (b) Name 4 minerals found near Drumheller.
- _____, _____, _____,
- _____

- (c) Name 2 minerals found north of Grande Prairie.
- _____

7. Look at the map on page 119 showing the roads of Alberta. Name the number of the main highway travelling from these points.

- (a) From Strathmore to Brooks _____
- (b) From Edmonton to Edson _____
- (c) From Camrose to Provost _____
- (d) From Calgary to Edmonton _____
- (e) From Lake Louise to Jasper _____
- (f) From Whitecourt to Valleyview _____
- (g) From Manning to High Level _____

8. Look at the map on page 120 showing Railways of Alberta.

- (a) Name the railway going into Fort McMurray _____.
- (b) Name the 2 railways going into Calgary _____, _____.
- (c) Which railway will stop at Brooks. _____.
- (d) Which 2 railways will stop at Grande Prairie _____, _____.
- (e) Which railway will take you to the Crowsnest Pass _____.

9. Look at the map on page 128 showing recreation spots of Alberta.

(a) Name the recreation spots located at the following numbers:

2 _____

4 _____

5 _____

6 _____

12 _____

13 _____

(b) What do the following symbols indicate on the map?





(c) Where do you find Hot Springs located in Alberta?

_____ and _____

(d) Are there any campsites located in the National Parks?

10. Look at the map on page 156 and 157. This map tells you how you can reach each city or town. It also tells you how many people live in each city or town.

(a) Tell how you can travel to each of the following centres:

Grande Prairie _____

Fort Vermilion _____

Edmonton _____

Canmore _____



(b) Name 2 places on the map that have a population over 300,000.

_____, _____

ACTIVITY STATION

SCAVENGER HUNT - ANSWER SHEET

1. 1969
2. (a) Saskatchewan
(b) British Columbia
(c) United States
(d) Northwest Territories
(e) Edmonton
(f) Banff National Park, Jasper National Park, Wood Buffalo National Park, Elk Island National Park, Waterton Glacier International Peace Park.
3. (a) Edmonton, Calgary, Lethbridge, Medicine Hat, Red Deer
(b) 50
(c) 1,331,911
4. (a) United Church, Roman Catholic
5. (a) Calgary - non-forested area
Whitecourt - forested area
Fort McMurray - forested area
(b) Blairmore - yes
Grande Prairie - yes
Edson - yes
Elk Island National Park - no
(c) Lookout towers
6. (a) salt, clay, shales
(b) bentonite, clays and shales, marl, and salt
(c) iron ore, bentonite

7. (a) Highway 1
- (b) Highway 16
- (c) Highway 13
- (d) Highway 2
- (e) Highway 93
- (f) Highway 43
- (g) Highway 35
8. (a) Northern Alberta Railway
- (b) Canadian Pacific Railway and Canadian National Railway
- (c) Canadian Pacific Railway
- (d) Northern Alberta Railway and Alberta Resources Railway
- (e) Canadian Pacific Railway
9. (a) 2 Alberta Game Farm
- 4 Brazeau Dam
- 5 The Badlands or the Biggest Little Church
- 6 Banff School of Fine Arts
- 12 Frank Slide
- 13 St. Mary Dam
- (b)  where campsites are located
-  where the hot springs are located
- (c) near Banff and Jasper
- (d) Yes

10. (a) Grande Prairie - airplane, railway, road
Fort Vermilion - road
Edmonton - airplane, railway, road
Canmore - railway, road
Drumheller - railway, road
Lethbridge - airplane, railway, road
- (b) Edmonton, Calgary

ACTIVITY STATION

OIL RE-REFINING

Motorists must frequently change the oil in their cars. Some people have it changed at a service station but many do it themselves. The people who change the oil themselves often do not know what to do with the old oil. Most people simply dump their waste oil on the ground.

But there is another alternative, one that not only lessens pollution but conserves energy supplies and results in a product that can be sold.

Two Alberta firms, Turbo Refineries Ltd., and Hub Oil Co. Ltd., are recycling large quantities of oil for use by both railways and automobiles.

Turbo re-refines oil from CP Rail, CN Rail and city service stations and they return it to the railroads for use as a lubricating oil.

Hub Oil re-refines oil collected from service stations and industrial sources throughout southern Alberta and they produce a crankcase oil called "Lubie Lube" which is sold in service stations and grocery stores across Western Canada.

The re-refined oil appears to have lubricating properties that are as good as those with oil refined directly from crude oil. The re-refined oil, however, usually costs a little less.

It is estimated that in Alberta only about one-twentieth of the oil sold in 1974 was collected and refined. About four-twentieths of the oil was burned during engine operation, and one-twentieth was used to keep dust down on rural roads. The rest of the oil sold was dumped on the ground, in the garbage, in sewers and perhaps even in streams. Much more of this oil should have been collected and reused.

Besides re-refining there are two other major uses for waste oil: fuel and road oiling.

Waste oil can be treated to remove the water and dirt, then it can be used as boiler fuel. This use of waste oil is not ideal for it does not work as well as regular fuel oil. It corrodes the burners and it does not smell very nice.

Alberta has used much of its waste oil to spray on rural roads; however, the provincial highways department has been discouraging this use for the oil does not seem to keep the dust down well and there is a possibility that the oil could be harming the environment.

It appears that re-refining is the best use of waste oil but the public must be trained to use the re-refined oil for it to be used effectively and in large amounts. There is no point in making more re-refined oil if it is not used. People must also be encouraged to save their waste oil if we are to conserve and use our oil wisely.

The Alberta government is helping by providing money to help cities build storage tanks to hold oil for re-refining. The people of these cities can help by taking their used oil to a service station where it will be stored until picked up by the re-refining companies. Most service stations in Edmonton and Calgary, for example, have storage facilities for waste oil and they have them pumped out free of charge when they are full. (Adapted from Oil Re-Refining article; Environment Views, Vol I, No. I, April-May, 1978, pages 22 and 23)

Something for you to do:

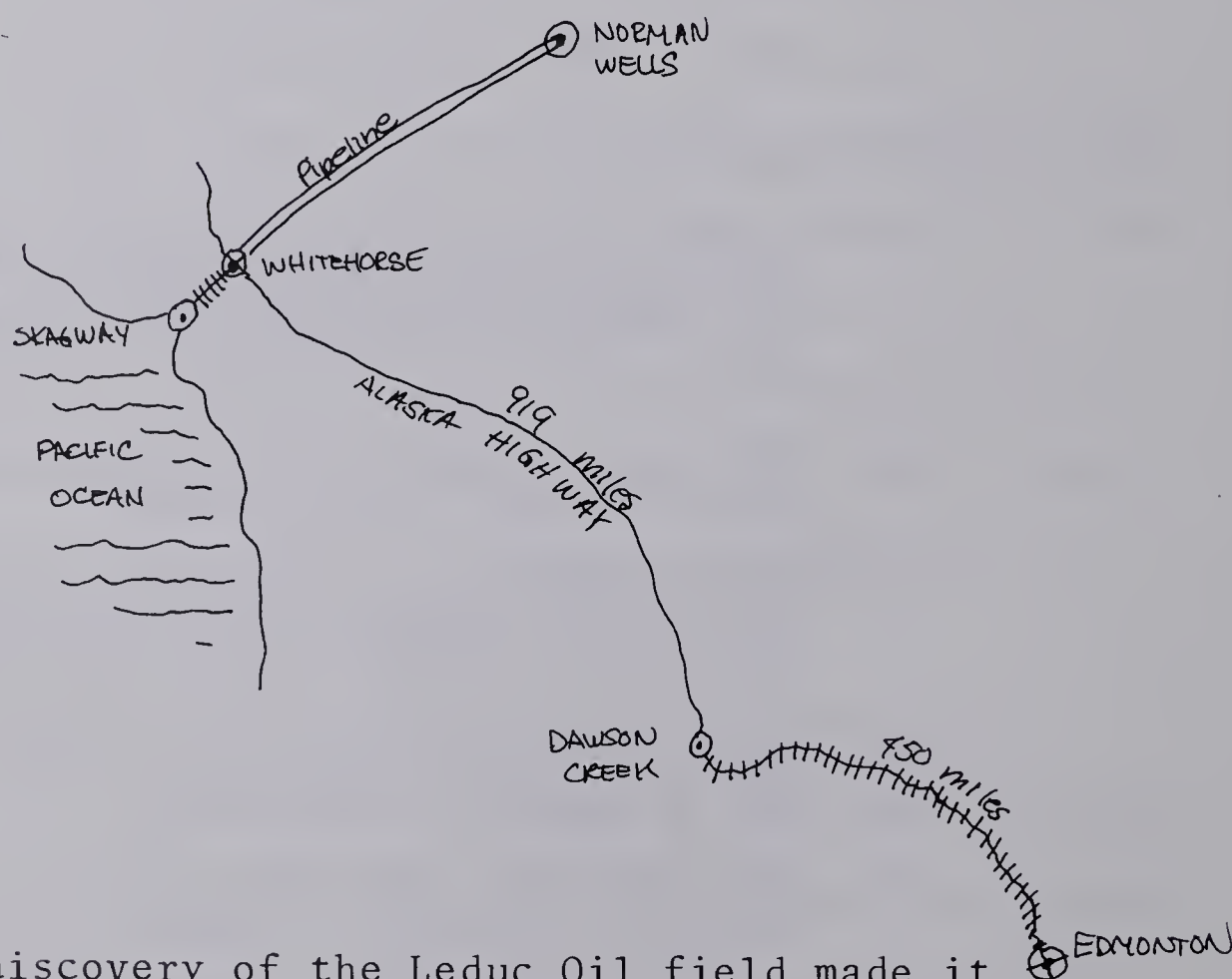
1. Check to see if your local service station has facilities for storing used oil. If they do not, check to see what they do with their used oil.
2. What is the danger of dumping oil on the ground, in the sewers or in streams?
3. Should Albertans be allowed to dump their waste oil on the ground, in the sewers or in streams? What do you think? Why do you feel this way?
4. Do you feel it is necessary to re-refine oil? Why do you feel this way?
5. How could you make the people in your community aware of the need to conserve oil?

ACTIVITY STATION

On February 13, 1947, the Imperial Oil Company discovered oil at Leduc. Before long oil derricks could be seen all over the countryside -- a major oil field had been discovered. The oil was transported to Edmonton but there was no refinery to refine the crude oil and make it useful. A refinery was really needed.

Read the following article to discover what Imperial Oil did about the problem.

THE TRAIL OF '48



The discovery of the Leduc Oil field made it necessary to have a refinery at Edmonton. It was not long after the end of the war and building materials were scarce. It would take a long time to build and equip a refinery.

Imperial Oil began searching for a good "used" refinery. They found one at Whitehorse, but it was 1350 miles away. That is a great distance to move anything as large as this. The refinery had been built during the war to supply the Americans based in Alaska with fuel from Norman Wells. When the war ended it was not needed as the American forces left the North. A bargain was made in the summer of 1947.

Imperial Oil paid the United States Government a million dollars and the refinery was theirs - if they could move it.

Experts were called in and a plan was drawn up. The refinery was to be taken apart at Whitehorse and moved over the Alaska Highway by truck to Dawson Creek, 919 miles away. At Dawson Creek it was to be shipped by rail to Edmonton.

Ten of the world's largest trucks were put into operation. They weighed almost twenty tons each and some had twenty-one forward speeds. Two skilled drivers were to take turns at driving until they reached Dawson, about 50 hours afterwards, having made only one scheduled stop for fuel. Driving these trucks was no easy job. The Alaska Highway is full of sharp curves, mountain slopes, and high bridges. A load of from 40 to 60 tons of bulky equipment was not easy to control. As winter came on, the Highway

became very icy and dangerous, but still the work was carried on.

About one hundred miles south of Whitehorse there is a wooden bridge over half a mile long. The engineers were afraid that this bridge would not carry the weight of some of the heaviest equipment. They decided that they would build an ice bridge across the lake. Water was to be allowed to freeze and layer after layer of ice was to be added until the ice bridge was strong enough to carry the heaviest loads. Unfortunately the expected cold weather did not arrive and the ice bridge could not be built. Some of the heaviest loads had to be taken by rail to Skagway, Alaska, and shipped by boat to Vancouver and again by rail to Edmonton.

At Whitehorse engineers were busy taking equipment apart. Each part was numbered, sketches were drawn and photographs were taken of the various parts of equipment. Some of the larger pieces had to be cut with blow torches and welded together again when they reached Edmonton.

The dismantling job included taking down several large towers, some weighing about 150 tons. It was not an easy job to work on top of a tower about 150 feet high, in the intense cold of the Yukon, especially on the days when an Arctic breeze was blowing. The long hours of darkness slowed up the job considerably. It was necessary to design and build special equipment to handle the large towers.

At Edmonton engineers were busy putting equipment together. Carefully they followed their photographs and blueprints and gradually the refinery began to take shape in its new home. It was officially opened on July 17, 1948.

The cost of moving the refinery was almost as much as it would have been to build a new one, but eighteen months were saved. Think of all the oil that could be refined in 18 months. This was one of the greatest engineering feats of all time. The refinery began operation long before the last piece of equipment reached Edmonton, and as more and more equipment arrived, its production became greater.

Fifty years before, in 1898, prospectors swarmed northward over this same route to the Klondike in search of gold. They travelled the Trail of '48 - in the opposite direction. Both "trails" were packed with adventure.

(Boon, I. and M. Boon., Alberta - Western Treasure Chest, p.72-74)

Something for you to do:

1. Make a list of all the difficulties that you can think of that Imperial Oil must have had in moving this refinery to Edmonton.
2. Do you think Imperial Oil should have moved this refinery? Why or why not?
3. Would you have liked to help move this refinery? Why? Why not?

ACTIVITY STATION

Alberta has built many pipelines to help transport her oil and gas. These pipelines have often been built across the land in other Canadian provinces and also into the United States. Natural gas has now been discovered in the Canadian Arctic. There is a possibility that a new gas pipeline will be built to transport the gas to southern centres. Read the following article to discover how the people feel about the construction of this particular pipeline.

WHAT DO YOU THINK?

by Ann Taylor

Far north, in the Canadian Arctic, there are plans to build a pipeline to carry natural gas to the south. The Mackenzie Valley Pipeline is one of the largest construction projects ever planned.

But building the pipeline along 2,600 miles of the Mackenzie River Valley could change life in the North forever. Inuit (Eskimo) people living along the Arctic coast and Indian people in the river valley have lived here for centuries—long before white men came. They hunted caribou to eat, caught fish and trapped animals for their fur. Many people still live off the land in the old way. Their land is very important to them.

Gas and oil are becoming scarce and expensive. People in the south need this energy to run their cars, heat their homes and operate industries. There are oil and gas in the Mackenzie Delta, the Beaufort Sea and the North Slope of Alaska. It is still not certain how much is there, but it could be a great deal.

Oil companies are drilling wells to get the energy out of the ground and are looking for more. But a way of carrying the gas from the north to the south is needed, and a pipeline seems to be the best way. Canadian Arctic Gas Pipelines Co. has asked the government for permission to build a 48-inch pipe along the river to bring gas from Alaska and Canada to be sold in both Canada and the U.S. Foothills Pipeline Co. Ltd. wants to build a slightly smaller line to bring Canadian gas to southern Canada only.

Building one of these pipelines would bring with it many changes. People from the south would come into the North to help build it. Roads and airstrips would have to be built through the country to the building sites; power lines would



have to be put up to bring power to the workers; processing plants would have to be built to prepare the gas to move through the pipe and maybe even a railroad would follow.

If enough oil is found, a pipeline to carry oil might also be built. More exploration will be necessary to find new supplies of gas and oil to keep the pipeline filled.

Building the pipeline could also mean jobs for the people of the north, more money to spend and more things to buy in the stores. So before government gives permission to build the pipeline, they decided to look at the changes it could bring.

A government agency called the National Energy Board will make

the final decision about whether the pipeline should be built and which company should build it. The government also asked Judge Thomas Berger of the British Columbia Supreme Court to talk to the people to see how they feel about this development. Judge Berger was asked to make suggestions about how the pipeline company should build the line and what they should do to protect the people's way of life and the land.

He has been working since March 1975 holding hearings. The hearings are like a court where people come to give evidence about what they think will happen if the pipeline is built. Some of these people are expert scientists, others are business-

men and builders. Each person is questioned by lawyers from both pipeline companies, the Indian Brotherhood of the Northwest Territories and COPE (The Committee for Original Peoples' Entitlement) which represents the Inuit people. As well as listening to the experts, Judge Berger has travelled to each of the 32 communities in the NWT that might be affected by the pipeline. At these meetings, the people of the settlements tell the Judge what they think. Older Indian and Inuit people tell stories about how they used to live, and the hunters and trappers show the Judge which parts of the land they use. Many native people tell Judge

Berger that they think the government should give them the ownership of the land before development goes ahead. This way the people would have some control over the construction and could make sure that the land is not destroyed. The Judge also held hearings in ten cities in the south so that everyone would have a chance to talk to him. Judge Berger has listened to hundreds of people, both young and old. From what the people have told him about their land and their life and from the information from scientists and other experts, the Judge will make recommendations about how the pipeline should be built. He may suggest what route

the line should follow, how to avoid certain areas that are important for fish and animals and how to make sure that northern people get jobs building and operating the pipeline if they want them. Judge Berger finished his hearings in October 1976. Now he will have to spend time studying what the people told him. His report should be ready to present to the government early in 1977. When the National Energy Board also makes its decision, we will know whether this huge project will go ahead or not.

(Canadian Children's Magazine, No. 5, Summer 1977, pages 42 and 43)

WHAT DO YOU THINK?

- 1. Divide a piece of paper in half. On one side write down all the reasons that you read or can think about that tell why a northern pipeline should be built. On the other side write down all the reasons that you can think of that are against the building of a northern pipeline.

Reasons for Building a Northern Pipeline	Reasons Against Building a Northern Pipeline
1.	1.
2.	2.
3.	3.

- 2. In your own words explain how you feel about this question: Should a Northern Pipeline Be Built? Make sure that you give reasons for your answer.
- 3. See if you can discover what Judge Berger recommended in his report. Perhaps you can ask someone who works for an Oil or a Pipeline Company. Do you agree with Judge Berger's decision? Why or why not?

ACTIVITY STATION

READING A NEWSPAPER ARTICLE

The following article appeared in the Calgary Herald on Wednesday, August 9, 1978. Read the article carefully in order to discover what happened when a pipe carrying natural gas was punctured.

Gas line leak forces residents out of homes

Four blocks around 15th Ave. and 10th St. S.W. were cordoned off and several people were forced to leave their homes when a 12-inch natural gas line was punctured Tuesday afternoon.

The line was ruptured by a bulldozer digging excavations for an eight-storey office building.

Escaping gas could be heard hissing from more than half-a-block away and immediately provoked fears of an explosion.

But, said fire department spokesman Larry Anderson this morning, the risk of a blast was slight as long as the proper precautions were taken.

"That is why," he explained, "we asked for traffic to be kept away and for some residents living near the actual rupture to be moved."

He denied the fire department over-reacted through their request.

"Our attitude," Anderson stressed, "is — It is better to be safe than sorry."

The puncture occurred around 3:30 p.m. and thousands of cubic feet of natural gas spewed out before, about an hour later, workers slipped a metal sleeve over the hole to control the leak.

Permanent repairs will be made today.

Two persons were reported taken to hospital after breathing fumes, but they were released after treatment.

Canadian Western Natural Gas will assess the cost of lost gas, emergency crew time, and materials, and then submit the bill to the contractors.

Something for you to do:

1. Write down the following facts:

WHO - The article is about.

WHAT - Happened.

WHEN - It happened.

WHERE - It happened.

WHY - It happened.

HOW - It happened.

2. Do you think the fire department over-reacted? Explain in your own words what you feel.
3. What effect did this leak have on the surrounding environment?
4. What do you think could have been done to prevent the accident?

"That's the normal procedure with incidents like this," said the gas company's distribution manager Ralph Pilkington this morning.

ACTIVITY STATION

A VISIT TO AN UNDERGROUND COAL MINE

Have you ever wondered what it would be like in an underground coal mine? Have you a picture in your mind of what you would see? Do you picture it as dark, damp, busy place? Well lets take a trip to an Alberta underground mine so you can really see what it is like.

DOWN INTO THE MINE

In a large shed at the head of the mine we prepare for our trip. The first thing we do is remove from our pockets any matches we might have (matches have a habit of lighting when they shouldn't). We do not want to cause a fire or explosion in the mine. Next, we put on a safety helmet to protect our heads from falling rock or coal. To the helmet is attached an electric lamp operated from a battery which we carry on our belt. Now we are ready!

A cage or elevator takes us quickly down the shaft and we soon find ourselves in a large hall lighted by electricity. No, it's not a railway station, but here is a train or "trip". We climb aboard one of the many little cars and in a moment we're off on a trip through the mine. As we travel along we notice that the walls and roof of the mine are supported by large beams. These beams take the place of the coal seam that has been removed.

When our train stops we decide to follow one of the smaller passages leading from the main passage. Here we need our electric lamps. Don't forget to duck under some of these beams!

At last we arrive at a little room where a man is busy cutting grooves in the coal with a large electric machine. Another man drills holes in the coal with a power drill. The holes are filled with liquid carbon dioxide. This changes to a gas when it gets warm. Gases take up more room than liquids do, so the pressure loosens the large chunks of coal on the grooves that have been cut. They either fall out of place or can be easily removed by the miner. This is much safer and cleaner than the old method of filling the holes with powder and blasting out the coal. Some mines still use the old method.

An electric loader places the coal on small cars. These cars are pulled by a small electric locomotive out to the main line where they are attached to a larger train and hauled back to the cage. We shall travel with the cars up to the surface where they enter a building called the "tipple". Here they are dumped and the coal weighed and credited to the miner whose number appears on the car.

The coal passes over a table where men remove most of the rock that is mixed with it. It is then carried by a

belt to a number of screens. The screens are of different sizes and as the coal is shaken over them the smaller pieces go through the small screens, the larger pieces through the large screens and the lumps pass on as lump coal. The various kinds of coal are now ready for shipment by train or truck. (Boon, I. and M. Boon., Alberta: Western Treasure Chest, p . 52)

Something for you to do:

1. If you had actually gone on a trip to a real coal mine, which part of the tour would you have enjoyed the most? Why?
2. Which part of the trip would you have found to be the most dangerous? Why?
3. Safety measures are most important for the workers in an underground mine. Can you explain why they would be so important?
4. Make a list of some safety measures that the workers in an underground mine must follow. Use an encyclopaedia to help you with the answer.

ACTIVITY STATION

THE STORY OF A PIECE OF COAL



Hello! I am a piece of coal. Long, long ago, I was part of a huge tree in whose shade great monsters once slept. That was in the days when our country was very, very warm. Finally, the tree of which I was a part, died and fell into some swampy ground. Grasses and weeds soon covered me up. Then the ground began to sink, soil was washed in and I was pressed into the earth. The sea came in and covered me with a great weight of water, sand and clay. It was stuffy down in the earth.

The next thing I remember, the earth began to rise and I expected to get my freedom, but I was disappointed. More trees and water plants fell above me, more sand and clay came in, and I found myself trapped under greater and greater weight. This went on several times and I found that I was pressed deeply into the earth. The great weight of the

material above me made life very uncomfortable and hot. By this time I was very much smaller than I had been when I first fell into the swamp. I was becoming harder and harder, and blacker and blacker. So life went on. Years and years passed by.

One day I heard some rumblings away down below me. Soon great heavings were going on. Heat inside the earth was causing it to bulge here and there and form the Rocky Mountains. I was pressed harder and harder. Then life went on as before for a few more thousands of years.

Not so long ago a grinding sound reached my ears. I listened carefully and discovered that someone was boring a hole near me. He filled the hole with some powder, lit the fuse and ran. There was a terrible explosion and I was blasted out of my home. I, with several of my neighbours fell to the floor of the little room. Life, since then has been very different for me.

A busy man picked me up and placed me in a little car. I was hauled away in the car to a little platform and quickly hoisted up the mine shaft into the daylight which I had not seen for thousands of years. Just when I was beginning to enjoy some fresh air I was dumped out of the car on to some sloping screens. Fortunately I was too large to fall through the screens. Some of my neighbours fell

through, they tell me, to become stove or peanut coal. Finally I bounced off the last screen into a truck. I am known as lump coal because I was too large to fall through the screens.

I wonder what will happen to me next. (Boon, I. and M. Boon., Alberta: Western Treasure Chest, p. 49)

* * * *

Something for you to do:

1. Pretend that you are black, sticky crude oil or light odourless natural gas. Tell your life story so that others can understand all that has happened to you.

WHAT DO YOU DO WITH A GHOST TOWN?

Nordegg was a town founded as a result of the coal industry. Mr. Martin Nordegg founded and managed the first coal mine there. The mining company began delivery of coal in 1911.

Today, however the houses are empty. No one has worked at the Nordegg mine since 1955. The town has become a GHOST TOWN!

Something for you to do:

- 1. Read the article, "What Do You Do With A Ghost Town?", found in the book Alberta - A People and a Province, page 79.
- 2. In a paragraph tell what you think should happen to Nordegg.

ACTIVITY STATION

The student's copy of the Word Find is located on the next page.

WORD FIND ON FOSSIL FUELS
Answer Sheet

N	O	N	R	E	N	E	W	A	B	L	E	R	O	F	P
A	E	D	O	O	A	L	B	E	R	T	A	S	S	U	E
T	C	R	U	I	L	C	O	R	E	F	U	E	M	P	M
U	R	Y	G	E	O	L	O	G	I	S	T	P	L	O	B
R	U	H	H	S	W	A	T	E	R	T	O	N	A	R	I
A	O	O	N	C	O	N	S	E	R	V	A	T	I	O	N
L	S	L	E	D	U	C	R	U	D	E	R	A	D	U	A
G	E	E	C	S	E	I	T	L	A	Y	O	R	E	S	E
A	R	A	K	N	O	M	U	D	N	R	I	S	R	L	G
S	Y	N	C	R	U	D	E	E	R	L	N	A	R	L	N
E	W	D	I	N	G	M	A	N	L	I	A	N	I	E	I
R	E	F	I	N	E	R	Y	I	B	O	G	D	C	W	N
L	P	I	P	E	L	I	N	E	E	R	E	S	K	S	I
O	C	O	A	L	U	G	P	E	T	R	O	L	E	U	M
T	U	R	N	E	R	V	A	L	L	E	Y	W	E	R	C
R	C	E	F	O	S	S	I	L	F	U	E	L	B	I	T

Sentence:

Fossil fuels are a non-renewable resource.

WORD FIND ON FOSSIL FUELS

Directions:

All of the following words on fossil fuels will be found in the puzzle, either vertically, horizontally, diagonally or even backwards. The puzzle will be easier if you find the bigger words first. As you find each word circle it and then check the word off the list of words. Some letters might be used more than once. If you write the letters left over, in order, beginning with those in the top row of the puzzle you should end up with the sentence FOSSIL FUELS ARE A NON-RENEWABLE RESOURCE.

Alberta	oil	N O N R E N E W A B L E R O F P
bit	ore	A E D O O A L B E R T A S S U E
coal	Pembina	T C R U I L C O R E F U E M P M
conservation	petroleum	U R Y G E O L O G I S T P L O B
core	pipeline	R U H H S W A T E R T O N A R I
crude	porous	A O O N C O N S E R V A T I O N
crew	pump	L S L E D U C R U D E R A D U A
derrick	refinery	G E E C S E I T L A Y O R E S E
Dingman	resource	A R A K N O M U D N R I S R L G
drilling	rig	S Y N C R U D E E R L N A R L N
dryhole	roughneck	E W D I N G M A N L I A N I E I
fossil fuel	royalties	R E F I N E R Y I B O G D C W N
geologist	Syncrude	L P I P E L I N E E R E S K S I
Leduc	tar sands	O C O A L U G P E T R O L E U M
mining	Turner Valley	T U R N E R V A L L E Y W E R C
mud	Waterton	R C E F O S S I L F U E L B I T
natural gas	well	
non- renewable		

ACTIVITY STATION

CHINOOK WINDS OF ALBERTA



A chinook is a warm, dry wind that blows down the slopes of the Rocky Mountains in winter and early spring. This warm wind which comes from the Pacific Ocean has lost its moisture by the time it has crossed the Rockies and it dries up snowdrifts and raises the temperature very quickly as it blows across the prairies. How did the Chinook get its name and how rapidly does it really come? Both the Indians and the Early Settlers have stories to tell.

Indian Legend:

1. Early Indian legends tell us that Chinook was a beautiful maiden who left her tribe. She became lost in the mountains in southwestern Alberta. Many Indian braves looked for the maiden. One day a warm, gentle wind started to blow from the west. The Indians believed that this was the breath of the beautiful maiden Chinook.

Pioneer Legends:

1. One very cold day an Indian and his wife were driving into Calgary from Morley, a distance of fifty miles or so. The Indian was driving and his squaw was sitting in the back of the rig. As they were driving along, a Chinook wind started to blow. The Indian whipped his horses trying to get them to move faster, but when he arrived in Calgary, his feet were frozen and his wife had a bad case of sunstroke!
2. One very cold day a pioneer was driving his dog-team into Calgary. A chinook began to blow. The snow melted very quickly. The pioneer said that his lead dogs were running through deep snow while the other dogs were running in dust!
3. One very cold day a pioneer trader is supposed to have started out by bobsled to Calgary. There was a foot of snow on the ground when he set out. During the drive a chinook began to blow and before he knew it, the snow was melting so fast that the front runners of his sleigh were in the snow and back ones were deep in mud. Driving as fast as he could he never managed to go fast enough to get the back runners up on the snow and he arrived in Calgary still half in snow and half in mud!
4. One very cold night a man hitched his team of horses to a post that was sticking out of the snow. A chinook blew

in that night and in the morning the man found that his team of horses were hanging from a church steeple!

Something for you to do:

1. Do you think that these stories about the chinook wind are true? Tell why or why not.
2. In your own words write a legend to explain what a chinook is and how rapidly it can arrive. Illustrate your story when you have completed it.

ACTIVITY STATION

WRITING LETTERS TO THE EDITOR

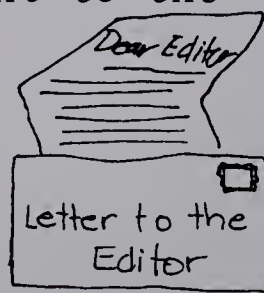
Look at the newspaper which your community receives. See if you can find the page containing letters to the editor. Citizens of a community will often write a letter to the editor so that they can express their views and thoughts on a particular subject. Sometimes the letter will be published in the newspaper.

You are to choose one area related to the topic of Alberta's Natural Resources and pretend to write a letter to the editor of the paper. Be sure to express your views as you see them. Also be sure to explain your idea clearly so that the editor and others can understand what you mean.

Perhaps you would like to express your opinion on one of the following topics:

1. Albertans need (or do not need) to conserve their natural resources. (Or pick just one of the natural resources to talk about.)
2. Albertans are using their water supply unwisely (or wisely).
3. Albertans should sell more of their oil to Eastern Canada (or should not).
4. Albertans should continue to search for oil and gas (or should not).
5. Albertans should take better care of their plant and wildlife (or do not need to take better care).

(Perhaps your letter could be sent to the editor of your local newspaper)



ACTIVITY STATION

MAKING POSTERS

Posters are often used to attract the attention of people to a particular event, to a particular place or to a particular thing or issue. Sometimes the people are attracted to the poster because of its colour, its printing or its pictures. In this activity you are to design one poster which could be used to attract people's attention to one of the following topics:

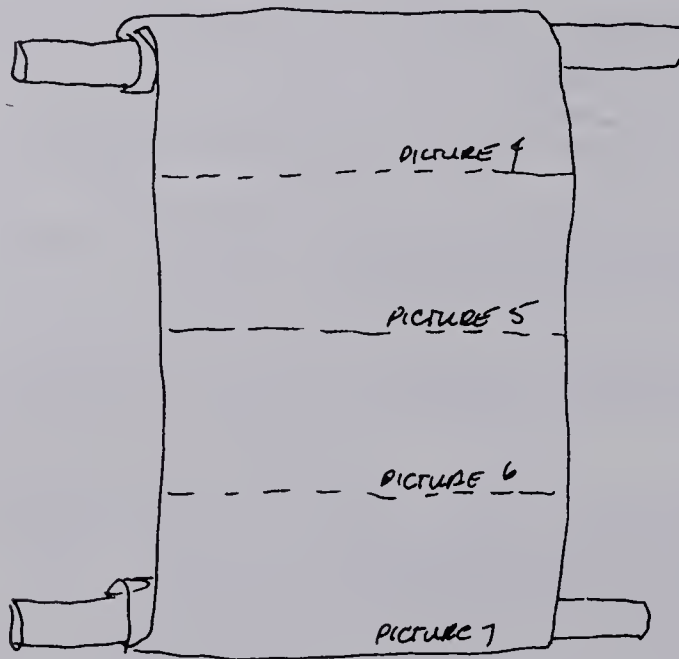
1. Advertise an Alberta summer lake resort at which people may enjoy boating and swimming.
2. Advertise the problem of water pollution.
3. Advertise the necessity of conserving our natural resources.
4. Advertise the necessity of putting out camp fires in order to protect Alberta's forests.
5. Advertise the sport of fishing but inform the people of the restrictions regarding the limit that one may catch.
6. Advertise the availability of irrigation.
7. Advertise the necessity of protecting the environment during mining operations.
8. Advertise the problems associated with building a pipeline across some nearby land.
9. Advertise the necessity of protecting Alberta's wildlife.
10. Advertise the necessity of protecting Alberta's wild flowers and plants.
11. Advertise the use of one of Alberta's natural resources.

ACTIVITY STATION

MAKING A "FLIMSTRIP"

Making a flimstrip to show others can be fun!

1. Decide on a topic
2. Draw and colour the pictures.
3. Tape the pieces of paper together.
4. Fasten the ends of the paper onto rolls from wrapping paper.
5. Choose someone to read or tell about the happenings as the filmstrip is turned.



TOPICS TO CHOOSE FROM

You may choose a topic about any aspect of Alberta's Natural Resources that you like but if you cannot think of a topic choose one from the list below:

1. How Water Gets Polluted.
2. Conserving Alberta's Natural Resources.
3. How We Get Paper.

4. Mining for coal.
5. Drilling For Oil.
6. Looking After The Wildlife In Alberta.
7. Protecting The Natural Resources In Our Community.
8. How Albertans Should Use Their Natural Resources.

ACTIVITY STATION

MAKING A MURAL

Make a wall mural showing Alberta's use of her natural resources from the past to the present. Divide the paper into 3 large sections: How Alberta's Indians Used Natural Resources. How the Early Settlers Use Natural Resources, How We Use Natural Resources Today.

Draw and colour or paint pictures to go on each section of the mural. Include as many uses for each natural resource as you are able.

NOTE: This mural could be started at the same time as the first station is started. As each new station is complete more pictures could be added to the mural.

A further section entitled "How Alberta Might Use Her Resources in the Future" could be added after study at all 5 stations has been completed.

ACTIVITY STATION

AN EXPERIMENT TO TRY

Sometimes when oil crews have discovered oil they will pump water down into the hole. Try the following experiment to see if you can discover why water might be put down into the hole.

1. Partially fill a glass jar with water.
2. Add some oil on top of the water (cooking oil will give the same results as crude oil).
3. Mark the upper level of the oil on the outside of the glass.
4. Add more water. What happens to the level of the oil? What does this tell you about why water may be pumped into an oil trap.

TEACHING UNIT EVALUATION
BY TEACHERS

The attached evaluation questionnaires will help assess the worth of the teaching units in achieving the goals of Alberta social studies education and to provide data that will be useful in assessing the 1978 Alberta Social Studies Curriculum over a two-year period.

Teachers are requested to send the completed questionnaire to the Social Studies Consultants at the Regional Office of Alberta Education in their area.

Regional Offices are located at:

Grande Prairie Regional Office
Alberta Education
10014 - 99 Street
GRANDE PRAIRIE, Alberta
T8V 3N4

Edmonton Regional Office
Alberta Education
10053 - 111 Street
EDMONTON, Alberta
T5K 2H8

Calgary Regional Office
Alberta Education
615 MacLeod Trail, S.E.
CALGARY, Alberta
T2G 4T8

Red Deer Regional Office
Alberta Education
4th Floor
Royal Trust Building
4814 Ross Street
RED DEER, Alberta
T4N 1X4

Lethbridge Regional Office
Alberta Education
Provincial Building
200 - 5 Avenue, South
LETHBRIDGE, Alberta
T1J 4C7

TEACHING UNIT EVALUATION

BY TEACHERS

Part I: Identification Data

Title of Teaching Unit _____

Date of Evaluation _____

Number of Times Unit Was Taught _____

School Size _____

Years of Teaching Experience _____

Part II: Overall Evaluation of the Teaching Unit

A. Format, Process

For items 1-13, please rate the kit in terms of the following aspects, by circling the appropriate number on the right.

(Excellent) 1 2 3 4 5 (Poor)

- | | |
|---|-----------|
| 1. Appropriateness of teaching unit to level and ability of students. | 1 2 3 4 5 |
| 2. Clarity of directions and procedures. | 1 2 3 4 5 |
| 3. Adequacy of the treatment of subject matter. | 1 2 3 4 5 |
| 4. Production quality of prescribed resources. | 1 2 3 4 5 |
| 5. Integration of prescribed resources with print materials. | 1 2 3 4 5 |
| 6. Production quality of teaching unit. | 1 2 3 4 5 |
| 7. Appropriateness of length of the unit. | 1 2 3 4 5 |
| 8. Appropriateness of general format of the unit (layout). | 1 2 3 4 5 |

- | | | |
|-----|---|-----------|
| 9. | Opportunities for evaluation of students' progress in the unit. | 1 2 3 4 5 |
| 10. | Variety of teaching/learning activities. | 1 2 3 4 5 |
| 11. | Degree to which the unit captured the interest of students. | 1 2 3 4 5 |
| 12. | Clarity and suitability of objectives. | 1 2 3 4 5 |
| 13. | Overall evaluation of unit (materials, format and process). | 1 2 3 4 5 |

B. Relationship to Curriculum

Please state your view of the points in items 14-25 by circling the appropriate number on the right.

(a great deal) 1 2 3 4 5 (very little)

- | | | |
|-----|---|-----------|
| 14. | Extent to which the unit involved students in making decisions. | 1 2 3 4 5 |
| 15. | Degree to which a "balance of viewpoints" was presented in the unit. | 1 2 3 4 5 |
| 16. | Extent to which the unit helped students to see the role that values play in making decisions. | 1 2 3 4 5 |
| 17. | Extent to which students increased their sensitivity to their own value positions. | 1 2 3 4 5 |
| 18. | Extent to which the unit helped to clarify the Alberta Social Studies Curriculum to you as a teacher. | 1 2 3 4 5 |
| 19. | Extent to which the unit has helped to develop inquiry and participation skills in students. | 1 2 3 4 5 |
| 20. | Extent to which the unit made you as a teacher more aware of ways to teach using an issue-centred approach. | 1 2 3 4 5 |

- | | | |
|-----|--|-----------|
| 21. | Extent to which the unit could act as a model for you to use in developing your courses in future, | 1 2 3 4 5 |
| 22. | Extent to which the unit served as an exemplary treatment of the topic in the curriculum. | 1 2 3 4 5 |
| 23. | Extent to which students became involved in action on decisions. | 1 2 3 4 5 |
| 24. | Extent to which the unit "process of inquiry" (awareness, focus on issue, research, decision, action) provided for a meaningful examination of a social issue. | 1 2 3 4 5 |
| 25. | Extent to which your view towards an inquiry approach has been made more positive (through using this unit). | 1 2 3 4 5 |

C. Written Comments

Please use this section to comment in detail on any points raised in the survey. We would be especially interested in knowing if the unit enabled you to teach the Alberta Social Studies Curriculum more effectively.

STUDENT EVALUATION OF
TEACHING UNIT

A. Instruction: For each of the following, circle the response which best represents your view.

Example:

My view of football (dislike it 1 2 3 4 5 (like it
is that I: very much) very much)

If you liked it very much, you would circle 5.

If you disliked it very much, you would circle 1.

If you disliked it somewhat more than you liked it, you would circle 2.

1. I would say that (hard) 1 2 3 4 5 (easy)
this unit was:
2. This unit was: (very boring) 1 2 3 4 5 (very interesting)
3. This unit: (did not make me think) 1 2 3 4 5 (made me think a lot)
4. This unit was: (too short) 1 2 3 4 5 (too long)
5. In this unit (not enough discussion) 1 2 3 4 5 (too much discussion).
6. In this unit (not enough reading) 1 2 3 4 5 (too much reading)
7. In this unit (not enough group work) 1 2 3 4 5 (too much group work)
8. In this unit (not enough decisions) 1 2 3 4 5 (too many decisions)
I had:
9. In this unit I (very little) 1 2 3 4 5 (a great deal)
learned:

10. The prescribed resources on this unit were: (poor) 1 2 3 4 5 (excellent)
11. The written materials on this unit were: (poor) 1 2 3 4 5 (excellent)
12. We went through this unit: (too slowly) 1 2 3 4 5 (too quickly)
13. The unit had: (no variety) 1 2 3 4 5 (much variety)
14. This unit made me: (want to forget the topic) 1 2 3 4 5 (want to learn much more about it)
15. Looking back, I would say that I: (did not enjoy unit at all) 1 2 3 4 5 (enjoyed it a great deal)

B. Please write your views on the following three items in the space provided.

1. What I liked most about this unit was:

2. What I liked least about this unit was:

3. The changes I would make in this unit are:

DATE DUE SLIP

DUE
EDUC FEB 23 '89

RETURN OCT 16 '01

DUE
EDUC MAR 02 '89

RETURN FEB 25 '01

MAR 01 RETURN

DUE
EDUC MAR 29 '89

DUE
EDUC APR 05 '89

APR 0

APR 06 '84

DEC 1 1983

MAR 26 RETURN

DUE
EDUC DEC 12 '83

DUE EDUC APR 10 '84

DEC 7 RETURN

APR 4 RETURN

DUE EDUC JUL 17 '84

JUL 16 RETURN

MAY 17 1983

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GR-4 TOP-A
SOCIAL STUDIES TEACHING UNIT
PROJECT GR 04-06 /
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